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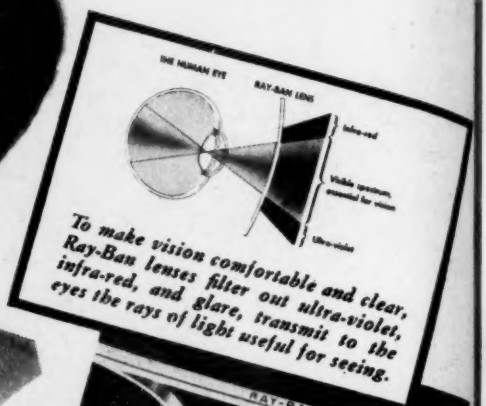

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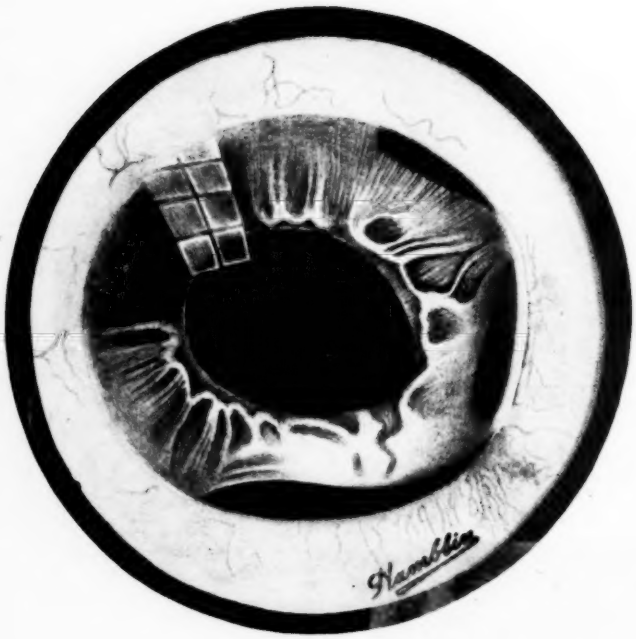

FIG. 1 (NEWELL). APPEARANCE OF THE EYE SIX WEEKS AFTER THE SECOND PROCEDURE.

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EXTENSIVE TRAUMATIC IRIDODIALYSIS WITH REPAIR*

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Separation of the ciliary border of the iris from its attachment may occur spontaneously in atrophy of the iris root or may follow blunt ocular contusions in which the iridodialysis is frequently associated with hyphemia, zonular rupture, subluxation of the lens, cataract, and ciliary-body detachment followed by atrophy. The traumatic type may vary in extent from a small defect visible only with a slitlamp to a detachment of the entire ciliary border with the iris falling to the bottom of the anterior chamber and visible as a small gray ball of tissue.

Small defects, those covered by the lids, and asymptomatic cases do not require operative treatment; whereas, large defects causing monocular diplopia, dazzling of vision, and photophobia should be corrected surgically if the concomitant ocular pathologic processes do not overshadow the iridodialysis. Since cases of large separation unaccompanied by other major pathologic conditions of the eye are relatively rare, this case is presented to illustrate a simple method of correction whereby gratifying functional and cosmetic results were obtained.

CASE REPORT

When the patient, a 24-year-old white soldier, was admitted to the 108th General (U.S.) Hospital, December 2, 1943, he stated that 48 hours previously he had been struck in the left eye by a small branch of a tree which caused immediate and severe ocular pain. He was immediately hospitalized, 1-percent atropine solution was instilled in the eye, and a binocular bandage was applied. Vision, two days after the injury, was 20/20 in the right eye; and 20/50 in the left eye. It could not be improved with correction. The only apparent damage to the left eye was a separation of the entire nasal attachment of the iris extending from the 10- to the 7-o'clock meridian. The iris was drawn toward the intact temporal attachment, and only the temporal portion of the pupil was visible. The free iris border appeared to float in the anterior chamber, but it was not possible to change its position by gravity. Intraocular pressure was 18 mm. Hg (Schiøtz-Gradle); peripheral and central visual fields were normal; the cornea and conjunctiva did not stain with fluorescein; and the fundus was normal. A slight hyphemia was present immediately after injury, according to the station hospital record, but this had absorbed without residue prior to admission. The chief complaint was dazzling and photophobia in bright light which was not relieved with tinted lenses. Treatment with 1-percent atropine solution, instilled locally four times daily, gave no evidence of response.

On December 8, 1943, the first of a

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two-stage operation was performed with O'Brien akinesia and retrobulbar procaine-hydrochloride and topical pontocaine anesthesia. A small conjunctival flap was prepared and a corneoscleral suture was placed at the limbus at the 2-o'clock meridian in such a manner that it could be tied over the cornea instead of the sclera. A small keratome incision was made between loops of the suture, and the peripheral border of the iris was grasped with an iris hook and drawn into the wound. With an assistant drawing up the suture while the hook was simultaneously disengaged from the iris, it was possible to incarcerate a small shred of tissue in the wound without prolapse. The previously prepared conjunctival flap was then drawn over the wound; the episcleral sutures were tied; and pilocarpine solution instilled. A binocular dressing was applied.

Convalescence was uneventful and all sutures were removed on the seventh postoperative day. The iridodialysis was reduced to about one half extending from the 2- to the 7-o'clock meridian.

On January 14, 1944, a similar procedure was performed with the keratome incision at the 5-o'clock meridian, with immediate restoration of a central round pupil and an anterior chamber of normal appearance. Three small peripheral defects were present between the areas of attachment but, as they gave rise to no symptoms, further surgery was considered inadvisable.

Vision was 20/30 in the treated eye, improved to 20/20 with a −0.75D. sph. ⊂ +1.00D. cyl. ax. 130°. Intraocular pressure was 22 mm. Hg (Schiøtz-Gradle). The peripheral field, central field, and accommodation were normal. The pupillary reaction to light was present only in the normally attached segment of the iris but the response of the pupil to miotics and mydriatics appeared normal. In April, 1945, 16 months after the second operation, in response to a questionnaire the patient replied that corrected vision was 20/20 and J1, the iris was still in position and no further hospitalization had been required.

Discussion

Reattachment of an iridodialysis occasionally occurs spontaneously even in the absence of active ocular therapy. In an early case (1830), Lawrence[1] reported recovery occurring after venesection. Vigorous atropinization of the injured eye has been recommended by Shedlow[2] and Brown[3] who each reported a case in which this treatment resulted in recovery. Duane[4] considered atropine unnecessary and attributed the fortuitous outcome to recurrent hemorrhages, with the formation of a fibrinous exudate which bound the iris in place. Such a result must be uncommon, however, for Wagemann,[5] in a comprehensive review of the subject, found only a few cases in which medical treatment was efficacious.

Surgical correction of iridodialysis may be conveniently divided into three main classes: (1) Iridectomy or iridotomy. (2) Reattachment to a fresh surface within the anterior chamber. (3) Incarceration of the iris in a corneoscleral wound.

Middlemore[6] suggested converting the two pupils into one by dividing the intervening portion of iris, but it is not clear whether he ever performed such an operation. Würdemann,[7] in at least one case, performed an iridectomy to remove a band of iris stretching across the visual axis and recommended the procedure. Recent publications have not mentioned this type of surgery, and it is probable that it has been generally abandoned.

Jameson[8] developed an ingenious method of repair in which a fine silk suture is introduced into the sclera, 2 or 3 mm.

behind the limbus and passed into the anterior chamber. The base of the detached iris is then transfixed, and the suture passed through the cornea where the needle is removed. Through a keratome incision, a small hook then engages the suture between the iris and the cornea, drawing it through the cornea into the anterior chamber and out through the ocular wound where it is tied. The iris then reattaches at the point of contact with the sclera. In the present case, it would have been necessary to perform the maneuver a number of times since the ciliary border of the iris was so distant from the nasal limbus that it was not possible to transfix the iris by using a needle of customary size.

Incarceration of the iris in a corneoscleral wound was originally suggested by Amédée,[9] in 1865, and the technique has been modified by a number of surgeons, the chief variation being the use of sutures between the iris and sclera as in the methods of Key[10] and Spaeth.[11] The amount of iris incarcerated varies from actual prolapse as in the methods of Smith[12] and Bulson,[13] to the inclusion of only a small shred of iris tissue as recommended by Goldfelder[14] and Wheeler.[15]

Correction of the defect in the present case was essentially the technique of the last two surgeons with the exception of the use of a corneoscleral suture, which by causing immediate closure of the wound insured incarceration of the iris and permitted full control of the amount of tissue included in the wound. Apparently the iris tends to be drawn toward its normal attachment, and actual prolapse is not a complication to be feared.

Summary

A case of extensive traumatic iridodialysis is presented in which a successful functional and cosmetic result was obtained by incarceration of a shred of iris tissue in a corneoscleral wound closed by suture.

30 North Michigan Avenue (2).

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EPIDEMIC RETROBULBAR NEURITIS IN THE PHILIPPINES DURING THE JAPANESE OCCUPATION*

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This report is impelled by two recent articles in ophthalmic literature—"Nutritional Amblyopia in American Prisoners of War Liberated from the Japanese," by Bloom and others[1] and "Ocular Lesions in Internees at a Civilian Internment Camp at Hongkong," by Talbot.[2] Although these authors agreed on the role nutritional deficiency had in causing the ocular symptoms observed, they differed in their reports of the manifestations of disease and in their interpretations as to the site of the lesions as well as to the deficient vitamin or vitamins. This report is based on studies made on Filipinos who suffered from retrobulbar optic neuritis which occurred in epidemic proportions in the Philippines during 1942 and 1943. While our observations and interpretations may vary from those of others who have reported on the ocular manifestations of nutritional deficiency, we hope that these studies may contribute to a proper evaluation of the factor of the "soil" in the etiologic consideration of optic-nerve lesions of nutritional or other origin.

According to Fernando[3] this Philippine epidemic commenced soon after the war; reached the maximum height of incidence about December, 1942, one year after the occupation; and had practically disappeared by the end of September, 1943. Although the records of the Philippine General Hospital show that 451 cases of retrobulbar neuritis were diagnosed in 1942 and 1943, in contrast to 72 cases in 1940 and 1941, this report is confined to the study of 28 cases in which examination and follow-up were unusually thorough, both extremely difficult procedures at that time.

In using the Comberg slitlamp especial attention was given to retroillumination in the study of limbal vascularization. The Ferre-Rand perimeter and the Bjerrum tangent screen were used. A white-ring fixation object was found to give the most accurate records especially in mapping the bilateral central scotomas present in these cases. Ophthalmoscopy was always done under mydriasis to permit careful examination of the macula. Following the advice of Traquair,[4] the presence of a scotoma was ruled out only by 1/2,000 white and 1/1,000 red or blue test objects. Filipino standards for visual fields and blind spot were first established before interpretations of field changes were made. Refraction was carefully checked in each case.

CASE REPORTS

Before summarizing our findings we shall cite two cases typical of the 28 cases studied.

Case 1. A woman, aged 28 years, complained of foggy vision in both eyes for one week. Positive scotoma, lacrimation, and photophobia were not present. For one month she had had angular stomatitis, and two days before she was first seen she had circumoral numbness. Her diet consisted mainly of rice and fish, meat occasionally, and vegetables rarely.

Examination showed nose, teeth, and tonsils to be normal. The Wassermann

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test was negative. There were no helminth ova in the feces. The eyes were normal externally. Fundus and biomicroscopic examinations showed no pathologic conditions. Vision was: O.U., 20/30; with the pinhole (2 mm.), no change. Near vision was: O.D., 14/21; O.S., 14/28, made worse by use of the pinhole. There were relative central scotomas for 3/1,000 red in both eyes. There was also bilateral concentric contraction, more temporally, of the peripheral fields for form.

The patient was advised to change her diet and to take a plate of mongo (a native bean) at each meal supplemented by leafy vegetables. She also took darak (rice bran), two tablespoonfuls in a glass of water with orange (citrus mitis blanco) and sugar, 10 times a day. Three months later, vision in both eyes was normal for far and near. The scotomas had disappeared, and visual fields were normal. During the eight months this case was followed, normal vision was maintained.

Case 2. A man, aged 26 years, had progressive blurring of vision and photophobia in the right eye for two months before he was first seen. Three weeks later the left eye showed the same symptoms. No lacrimation, pain, positive scotoma, nor numbness of the extremities were present. Three weeks before visual symptoms appeared, the patient had bilateral, angular stomatitis. The diet was poor, especially in vitamin B.

Examination showed the Wassermann test to be negative. No helminth ova were present in the feces. Teeth, nose, and tonsils were normal. The eyes showed no external abnormality. The fundi were normal. Biomicroscopy revealed a clear cornea, marked limbal pigmentation, and practically normal limbal vascularization in both eyes. Vision was: O.U., 20/50 and 14/42, unchanged by use of the pinhole. There was no manifest refractive error. There was a large bilateral centrocecal scotoma for 1/1,000 white. Visual fields were normal.

The patient in this case was also advised to change his diet. He also began taking "tiki tiki" (rice bran extract) a tablespoonful, three times a day. A week later, his vision had deteriorated to: O.D., 20/160, 14/89; and O.S., 20/50, 14/56. After that, however, it continued to improve. After one month, vision was: O.U., 20/20, 14/35, with very marked subjective improvement. After nine months, vision was normal for far and near and no scotoma was present.

Summary of findings

The youngest patient in the series studied was 15 years of age, and the oldest was 60 years of age. The average age was 32 years, and the majority of patients were between 20 and 30 years of age. The almost equal number of men and women (15 m.; 13 f.) belonged, generally, to the lower middle class. Although many of them were unemployed, none could be considered destitute. In private practice, this form of retrobulbar neuritis was found even among the well-to-do class.

All except one case (7) had bilateral involvement, both eyes being affected at the same time in the majority of cases. The one unilateral case was seen early when vision was only slightly impaired, 20/30 in the affected eye with a small, relative central scotoma for red. A month after she was first seen, when vision was almost normal again, this patient failed to return.

The primary complaint of all patients was a failure of vision described as similar to that observed when looking through smoke. Except in a few cases the maximum failure of vision was three or four weeks after the onset. Photophobia, which is not the same as glare blindness (Yudkin[5]) was a complaint in one third of the

cases. Five cases (17.6 percent) had lacrimation with either itching, redness, or smarting of the eyes. Ocular pain, mucoid discharge, dizziness, and the sensation of warmth in the eyes were observed in individual cases. Headache, generally frontal, was present in four cases. Angular blepharitis associated with angular stomatitis was noted in only one case. Bilateral positive scotoma was a complaint of only one case (10).

Angular stomatitis was present at one time or another during the course of the ocular affection in 71 percent of the cases. Symptoms referable to peripheral neuritis, such as numbness around the mouth and of the extremities and paresthesia of the toes, feet, legs, or fingers, hands, and forearm were found in one half of the cases. Glazed tongue was found in 14.7 percent and scrotal pruritis in 7.1 percent. All except one patient had a deficient diet limited to rice and fish. Some diets had a moderate supplement of vegetables, and a few had a little meat. Only slight losses of weight were shown in these cases.

Seven patients were habitual cigarette smokers, and one patient was a tuba (a native alcoholic beverage) drinker. Two patients were lactating mothers; and two had histories of diarrhea for 2 or 3 months before the onset of ocular symptoms. Two patients had a purulent urethritis and one had a gall-bladder disease.

In all except two cases, there were no external signs of pathologic conditions of the eyes. In one case there was a slightly abnormal limbal vascularization, and in another case there was an anterior polar cataract.

The vision in all cases ranged from 20/30 to 2/200 or less. In four patients vision was 20/50 or better; in two, 20/50 to 20/100; in six, 20/100 to 20/150; in two, 20/150 to 20/200. Fourteen patients, or 50 percent had vision of 20/200 or less. The subnormal near vision present in all cases was not due to accommodative error.

With no exceptions, a scotoma was demonstrable in every case. The scotoma was absolute in 24 cases, and relative, especially to red, in four. There were 19 bilateral central scotomas, and four bilateral centrocecal scotomas. Five patients had a central scotoma in one eye and a centrocecal scotoma in the other eye. In the only unilateral case, a central scotoma was present in the involved eye. The blind spots were normal in one half of the cases. Five of these had definitely enlarged blind spots distinct from the central scotoma in both eyes; while in four cases, the enlarged blind spots merged with the central scotomas and resulted in bilateral centrocecal scotomas. In five cases, there were unilateral centrocecal scotomas with distinct central scotoma and enlarged blind spots in the other eye. We have found that without the use of a white-ring fixation object, it is easy to record a paracentral scotoma when a central scotoma is really present.

Eighteen cases (64 percent) had normal visual fields. Four had temporal contraction of 5 to 10 degrees for form in one or both eyes, and five had temporal contraction of more than 10 degrees. Nasal contraction of 10 degrees was noted in only one case, but no case showed a very marked concentric contraction as reported in the series of Talbot. It will be seen that while a central scotoma was invariably present, enlarged blind spots, distinct or merged with the central scotoma, were recorded in one half of the cases, while only one third had peripheral field changes which were mainly temporal.

Twenty cases (71.4 percent) had normal fundi. Three cases had temporal pallor of the disc, while three other cases had no abnormal change except absent foveal reflexes. Two had hazy media due

to lenticular opacity in one and epithelial corneal dystrophy (de Ocampo[6]) in the other. One had slight congestion of the disc. There were no abnormal biomicroscopic findings in 16 cases (57.1 percent). Eight showed only moderate to marked limbal pigmentation. One had epithelial corneal dystrophy associated with abnormal limbal vascularization, while another had minimal epithelial corneal dystrophy with limbal pigmentation but no vascularization. One had slight abnormal limbal vascularization but no corneal lesion, and one had arcus senilis.

Wassermann blood tests were made in 16 of these cases. All of them were negative. Feces of 5 of 11 patients showed ova of Ascaris and Trichuris trichiura.

Various forms of treatment were tried. A change of diet with the addition of beans containing around 90 international units of vitamin B_1 (per serving) plus green leafy vegetables was advised in half of the cases. Seven patients were instructed to take a suspension of rice bran with native orange and sugar in addition to the changed diet. The rice bran contributed approximately 6.6 I.U. of vitamin B_1 daily. In addition to the prescribed diet and rice bran, three cases were treated with transorbital diathermy (Birch-Hirschfeld[7]) for 10 minutes daily for an average of 10 days. One case received diathermy and dietetic treatments, while another was given brewers yeast tablets in addition to the changed diet. Of the 12 patients who did not receive any change in diet, five failed to return for sufficient follow-up. Of the remaining eight patients, two received rice bran alone; three, diathermy alone; one, thiamine chloride only (10 mg. daily for 6 days); and two, no treatment, dietetic or otherwise. The results are shown in Table 1.

TABLE 1

RESULTS OBTAINED WITH VARIOUS THERAPIES USED IN TREATING RETROBULBAR NEURITIS IN 23 PATIENTS

Treatment Given	No. of Cases	Recovered	Markedly Improved	Moderately Improved	Unchanged	Worse
Diet alone	3	1	1	1		
Diet and rice bran	7	4	1		2	
Diet, rice bran, and diathermy	3		1		1	1
Diet and diathermy	1			1		
Diet and thiamine	1		1			
Diet and brewers yeast	1	1				
Rice bran alone	2		1	1		
Diathermy alone	3		1	2		
No treatment	2			1		1
Summary	23	6 (26%)	6 (26%)	6 (26%)	3 (13%)	2 (8.7%)

It may be said, therefore, that in 78 percent of the cases, there was a change for the better and in one case (4.3 percent) even without treatment. In only two cases (8.7 percent) was the condition progressive; and one of these received no treatment at all. In three (13 percent)

the condition was stationary during the period of observation. Although the number of cases which were carefully followed during this epidemic of retrobulbar neuritis is small, it is our impression that the prognosis for the epidemic as a whole was good.

Comment

The diagnosis of retrobulbar neuritis was based on the demonstration of a central scotoma when the fundus was normal or essentially normal. We have not, in fact, been convinced that there is a pathologic significance in the absent foveal reflexes except when there are other fundus findings, because this condition is occasionally encountered in normal individuals. When, however, other macular changes are present, such as the stippling and abnormal reflexes found by Bloom, we consider the condition to be one of central choroidoretinopathy. When the relative scotoma for red is more prominent than that for blue, as in these cases, the condition is more likely a retrobulbar neuritis than a retinal lesion such as Talbot considered present in his cases.

We prefer the diagnosis of retrobulbar neuritis to nutritional amblyopia, which is a vague term, or to optic atrophy, because in our series of cases only 13 percent showed an appreciable pallor of the temporal disc, which is an accepted sign of retrobulbar neuritis of some standing. In fact, in a few cases the pallor had progressed to primary optic atrophy. We have called the condition epidemic retrobulbar neuritis because of its occurrence in epidemic form; however, we believe that it was not contagious nor infectious. Oguchi[8] reported, in 1930, an epidemic of optic neuritis in Japan, axial in type with superficial keratitis, which he attributed to a deficiency of vitamin A.

It will be noted that this epidemic retrobulbar neuritis was not only axial but that there were also peripheral field changes in one third of the cases and blind-spot enlargements in one half. These conditions pointed to involvement of the fibers at the periphery of the nerve as well as in and around the papillomacular bundle. The course of the disease was subacute or chronic in the majority of cases, although the prognosis was good as a whole, especially when the case was seen early, and the nutritional deficiency was sufficiently corrected. There seemed to be a tendency toward improvement even when no treatment or only vasodilator therapy—transorbital diathermy—was given.

That these patients were suffering from deficiencies not only of vitamins but also of protein, carbohydrate, fat, and so forth was beyond doubt. The deficiencies were not so extended, however, as in the cases of those Americans and British reported by Bloom and Talbot, since loss of weight was not marked. The fact that these patients improved or recovered when they received better diets and additional amounts of vitamin B_1 or vitamin-B complex proved only that whatever other etiologic factors were involved, vitamin-B complex and vitamin B_1, which act as catalysts, and vitamin A played a part. Burn[9] found histologic evidences of a high incidence of nerve degenerative changes among Filipinos even before the war. The epidemic subsided although the food shortage continued. During the later part of the Japanese occupation in 1944, when evidences of nutritional deficiencies were found even among the well-to-do classes, cases of retrobulbar neuritis were uncommon. Even during the epidemic, it was common to find only one member in a family on practically the same diet affected with retrobulbar neuritis. In our series only one instance of the disease occurring in husband and wife

was recorded. Children were exempt from this epidemic.

Statistics on the cause of retrobulbar neuritis in different countries at different times show wide variations (Benedict,[10] Uthoff,[11] Langenbeck,[12] and Cibis[13]). One misleading factor in the etiologic consideration of retrobulbar neuritis in general is the tendency to spontaneous recovery in the majority of cases (Duke-Elder,[14] Dunnington,[15] Editors of E.E.N.T. Yearbooks of 1933 and 1935[16]). We also noted this tendency to some extent in this epidemic. Focal infection was present in a few of the cases. Syphilis could probably be ruled out by the course of the affection. Of the demyelinating diseases, multiple sclerosis, whose cause is unknown but which leads in the listed causes of retrobulbar neuritis in America and Europe, cannot be definitely excluded as a cause in some of these cases. The bilateral occurrence of the disease is, however, very much against this hypothesis. A sinus etiology usually shows a bilateral lesion with more blind spot changes than axial involvement.

Concerning the nutritional causes of retrobulbar neuritis, there is much confusion in the literature (Elliot,[17] Oguchi,[8] Moore,[18] Fernando,[19] Johnson,[20] Kilgore,[21] Gordon and Sevringhaus,[22] and Veasy[23]) as to the role of vitamins B_1 B_2, B complex, and A. Experimentally produced human deficiencies of these vitamins do not cause retrobulbar neuritis as it is found in the clinics. It is generally recognized that the therapeutic effect of vitamin B_1 in neuritis is not specific (Vorhaus[24]). The factors of the proportion of the deficiencies and of the individual reaction influence the various clinical manifestations of vitamin deficiencies in man.

Retrobulbar neuritis is a neurodystrophic process in which, according to Speransky,[25] the history of each individual nervous system is important. During the Japanese occupation, not only was there shortage of food in the Philippines but there was much emotional strain or trauma on the nervous system of the people. Even in toxic amblyopia, Duke-Elder[14] mentions that during periods of emotional strain, a habitual drinker or smoker may develop amblyopic symptoms.

After taking all these factors into consideration, we believe that more than one cause may have existed in this epidemic of retrobulbar neuritis (Lillie[26]). In a population that, even before the war, showed a high incidence of nerve degeneration (although not of the optic nerve) from toxic or poor nutritional conditions, this neurodystrophic process of the optic nerve increased, under war conditions, to epidemic proportions directly and mainly because of nutritional deficiency and hypovitaminosis. Although those patients who developed this affection were certainly subjects of multiple hypovitaminosis, clinically or subclinically, and showed prominent extraocular signs of vitamin-B-complex deficiency, the eye lesion of retrobulbar neuritis was probably due to a deficiency of vitamin B_1 (beriberi factor). The few patients who, in addition to retrobulbar neuritis, had some abnormal limbal vascularization probably suffered from an ocular deficiency of vitamin-B complex. In the very few patients who, in addition to affections already named, showed an epithelial corneal dystrophic lesion without abnormal limbal vascularization, an objective ocular vitamin-A deficiency was probably also present. The predisposing factors may have been: (1) the individual and racial nervous system or "soil"; (2) the emotional strain of the war; (3) focal infection, tobacco and alcohol, lactation, other diseases, and unknown factors.

Philippine General Hospital.

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RATE OF DARK ADAPTATION AND REGIONAL THRESHOLD GRADIENT OF THE DARK-ADAPTED EYE: PHYSIOLOGIC AND CLINICAL STUDIES*

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Measurements of the rate of dark adaptation and of the light threshold of the fully dark-adapted eye as indices of vitamin-A deficiency have been extensively studied in recent years. The earlier investigations led to the conclusion that subclinical vitamin-A deficiency, as manifested by such tests, occurs in a high percentage of the population. These reports, however, were soon followed by critical studies which questioned the norms used in diagnosing subnormal light sensitivity and emphasized the many controls necessary to obtain reliable measurements of the light thresholds.

More recent investigations have employed adequately standardized instruments and procedures in measuring light thresholds. These studies, although they do not support the view that vitamin-A deficiency is prevalent in the United States, however, do present suggestive evidence for a cause and effect relationship between vitamin-A intake and the visual threshold for light, particularly the threshold of the fully dark-adapted eye. The evidence is of two types.

1. Many patients with increased light thresholds not associated with organic disease of the eye are improved or restored to normal by vitamin-A therapy.

2. Normal subjects, when placed on a diet low in vitamin A but adequate in other essentials, may show an increase in light thresholds. Individuals vary markedly, however, in the time required to produce a significant increase in the thresholds and in the time required for recovery when vitamin A is resumed. These studies have been reviewed in detail by Mandelbaum,[1] Sheard,[2] Holmes,[3] and Nylund.[4]

There is also some suggestive evidence that riboflavin may play a part in the process of dark adaptation, either directly or by influencing the ability to absorb or to utilize vitamin A. Pock-Steen[5] reported that patients with leiodystonia and sprue complained of poor vision in dim light, and that these symptoms were not influenced by vitamin A but were greatly improved by riboflavin. A patient with Plummer-Vinson syndrome, reported by Pollak,[6] had markedly impaired dark adaptation which was improved by riboflavin and restored to normal by brewers yeast. Kimble and Gordon[7] found that some patients with subnormal dark adaptation who were not improved in two months on vitamin A alone were restored to normal when further vitamin A plus riboflavin was given.

Mention has been made[8–15] of the occasional occurrence of visual-field defects in patients with poor dark adaptation associated with vitamin-A deficiency. The defects noted were detected on routine perimetric examination except in the studies of Weekers and Roussel. They used a special technique in which the extent of the visual field was determined at intervals during dark adaptation. They found that with dark adaptation there was a significant difference in the results for a control group of normal subjects and a group of malnourished patients from European war prison camps.

The purposes of this paper are: (a) to present norms for a new technique of

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measuring the light sensitivity, particularly of the retinal rods; (b) to offer further data on individual variations in response to an experimental diet low in vitamin A; (c) to report a series of patients with little or no systemic evidence of vitamin-A deficiency who nevertheless showed elevated light thresholds which were restored to normal either on vitamin A alone or on vitamin A plus riboflavin; (d) to present further data on the relationship between contraction of the visual field in moderate illumination and elevation of the light thresholds of the fully dark-adapted eye.

Technique

The visual-field studies were made with a standard Ferree-Rand perimeter. The illumination incident on the perimeter arc is 7 foot-candles; the brightness of the arc, 0.7 apparent foot-candles (approximately 0.7 millilamberts). The instrument used in studying the light sensitivity has been described in previous papers.[8-16] It differs from those used by other investigators in that measurements may be made in any desired retinal region from center to far periphery. The procedure used in this study is as follows.

1. The eye is exposed for 3 minutes to an adapting field whose brightness is 1,100 millilamberts.

2. The light threshold is determined at intervals during adaptation to darkness, until it shows no further significant decrease. For these measurements of the rate of dark adaptation the 1-degree white test field is placed in the nasal field 15 degrees from fixation.

3. When dark adaptation is essentially complete, usually in 35 to 40 minutes, the light threshold is measured at the fovea and at 18 other locations extending to 50 degrees in the nasal field and to 96 degrees in the temporal field.

4. At the completion of these measurements a photograph of the pupil is taken with photoflash illumination. This is used in correcting the thresholds for differences in size of pupil as explained below.

Individual differences in size of pupil influence not only the effective brightness of the test spot but also that of the adapting field. In measurements of the dark-adaptation curve, rigid standardization of this variable factor can be achieved only by the use of an artificial pupil for viewing both the adapting field and the test field. In this study, because of the practical difficulties in using such a device, no attempt has been made to eliminate this variable in determinations of the adaptation curve. It is, however, feasible to correct the final thresholds of the fully dark-adapted eye for differences in size of pupil.[17] The final threshold, therefore, can provide a more reliable basis for detecting slightly subnormal light sensitivity than the thresholds measured during the course of dark adaptation, particularly in the case of patients whose pupils are fixed either by a drug or by organic changes. In this study the data used in charting the threshold gradient of the dark-adapted eye are corrected to give the equivalent threshold for a pupil 7 mm. in diameter.

Variation in normal subjects*

In order to make a diagnosis of subnormal (increased) light thresholds, it is necessary to have data, obtained under standard conditions, showing the range of normal physiologic variation. These data should apply to subjects of the ages, levels of intelligence, and so forth likely to occur in the clinical studies. Our normal group comprised 101 subjects whose ages ranged from 14 to 70 years. Fourteen of

* I am indebted to Dorothy C. Leonhardt for testing the normal subjects and making the statistical computations.

the subjects were Negroes. All had clear media, normal pupillary reactions, normal fundi, and corrected visual acuity of 20/20 or better.

The data on rate of dark adaptation are summarized in Table 1. Column 2 gives in logarithmic units the mean value of the threshold after 1, 2, 4, 6, and so forth minutes of dark adaptation. For each subject these thresholds were read from the smooth curve drawn through the experimentally determined points. Column 3 gives for each of the selected times of dark adaptation the standard deviation* of the threshold, S.D. The greatest variation (S.D. equals 0.38) occurs at 12 minutes; the least (S.D. equals 0.24), at 30 and 35 minutes. The distribution of the individual thresholds at each time of dark adaptation was found to show a close agreement with the theoretical "normal distribution curve." In a normal distribution, 68 percent of the cases fall within M + S.D. and M − S.D.; 95 percent are included between M + 2 S.D. and M − 2 S.D.; and 99.7 percent between M + 3 S.D. and M − 3 S.D. A threshold between M + 2 S.D. and M + 3 S.D. may be considered as questionably subnormal, since only about 2.5 percent of normal individuals have thresholds within these limits. A threshold greater than M + 3 S.D. for practical purposes may be accepted as definite evidence of subnormal light sensitivity.

TABLE 1

DATA ON RATE OF DARK ADAPTATION

Minutes in Dark	Log Threshold, Micromicrolamberts	
	Mean	Standard Deviation
1	7.53	0.31
2	7.10	0.28
4	6.75	0.25
6	6.62	0.26
12	5.69	0.38
15	5.12	0.33
20	4.60	0.28
25	4.37	0.25
30	4.22	0.24
35	4.16	0.24
	Average S.D.	0.28

Mean of Transition Time (minutes)—8.9.
Standard Deviation—1.36.

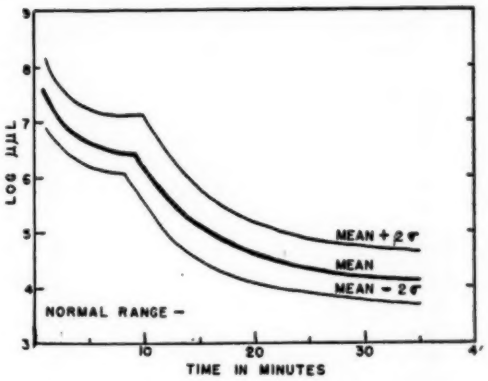

Fig. 1 (Sloan). Rate of dark adaptation after pre-adaptation to 1,100 millilamberts. A 1-degree white test field located 15 degrees from fixation in nasal field. The area between the upper and lower curves includes 95 percent of those tested.

Figure 1 shows the adaptation curve based on the mean values of threshold, as well as the curves for M + 2 S.D. and M − 2 S.D. The area between the two latter curves defines the region in which 95 percent of the thresholds of normal individuals may be expected to fall. Thresholds close to the upper curve may be considered questionably subnormal and those more than about 0.3 log unit above it definitely so. A distinct break in the course of the adaptation curve occurs after about 8 or 10 minutes of dark adaptation. The time at which it occurs is known as the "transition time." The thresholds prior to the break measure cone response, because during the early stages of dark adaptation the cone thres-

* The standard deviation, S.D., is a statistical measure of the scatter of the individual observations above and below the mean, M.

hold is lower than that of the rods; those after the break measure rod response because the rod threshold has fallen below that of the cones. The last entry in Table 1 gives the mean value and the standard deviation of the transition time.

TABLE 2

DATA ON THRESHOLDS OF FULLY DARK-ADAPTED EYE

Location in Horizontal Meridian	Log Threshold, Micromicrolamberts	
	Mean	Standard Deviation
50° Nasal	4.50	0.53
40°	4.26	0.35
30°	4.16	0.30
20°	4.07	0.28
15°	4.01	0.25
10°	4.09	0.24
6°	4.26	0.27
0°	4.87	0.49
6° Temporal	4.22	0.30
10°	4.11	0.28
20° (or 22°)	4.21	0.23
30°	4.14	0.24
40°	4.10	0.22
50°	4.16	0.26
60°	4.24	0.28
70°	4.38	0.33
80°	4.74	0.50
90°	5.33	0.72
96°	5.98	0.95

Horizontal-meridian threshold (average of thresholds at 19 different locations)—4.41.
Standard Deviation—0.25.

Table 2 and Figure 2 give similar data on the thresholds of the fully dark-adapted eye at 19 different locations in the horizontal meridian. As explained previously, a correction factor has been applied to these values to give the thresholds for a pupil of 7 mm. in diameter. Column 2 of the table gives the mean values of the threshold; column 3, the corresponding standard deviations. The standard deviations indicate that there is greater variability in threshold in the far periphery and at the fovea than in the paracentral regions. The relatively large range of variation at the fovea is probably due in part to the difficulty in maintaining accurate fixation. The pericentral fixation device, used in measuring the foveal threshold, does not in some patients maintain fixation as accurately as does the luminous red fixation target used for the other measurements.

The last entry in Table 2 gives the mean and standard deviation of the "horizontal-meridian threshold." This is an index of the average threshold level throughout the horizontal meridian and is computed for each subject by averaging the readings at the 19 different locations. The horizontal-meridian threshold gives an evaluation of the general threshold level and should be a sensitive index of any condition producing a generalized rather than a localized decrease in light sensitivity. Figure 2 shows graphically the threshold gradient, or variation in threshold from center to periphery, for the horizontal meridian. Only the values two standard deviations above and below the mean are charted. The mean threshold

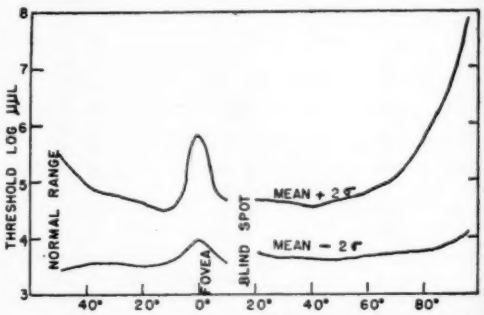

Fig. 2 (Sloan). Threshold gradient of dark-adapted eye in horizontal meridian. A 1-degree white test field. The area between the upper and lower curves includes 95 percent of those tested.

lies midway between the two curves shown in the figure. As in Figure 1 these two curves define the region in which 95 percent of the thresholds of normal individuals may be expected to fall.

In previous investigations of the dark-adaptation curves of normal subjects, an increase in threshold with age has been found,[18, 19] indicating a possible need

for different norms for different age groups. An analysis of our data shows that the increase with age is attributable in part, although not entirely, to the accompanying decrease in area of pupil. When the original threshold measurements are used, without correction for differences in size of pupil, there is a correlation of 0.48 between the horizontal-meridian threshold and the age of the subject. When, however, this correction is applied, thus eliminating the effect of pupil size, a relatively low correlation (0.28) is found between age and light threshold. Further statistical analysis shows that, without correction for size of pupil, the light threshold increases 0.10 log unit per decade. When this correction is made, the increase per decade is only 0.05 log unit. It may be concluded, therefore, that the increase in threshold with age is negligible* when the threshold is corrected for differences in size of pupil.

Effect of a diet low in vitamin A

The effect of a diet low in vitamin A but adequate in all other essentials was studied in five subjects.† Cases 1 to 3 received less than 200 I.U. of vitamin A per day, Cases 4 and 5 less than 100 I.U.

Cases 1 to 3. The changes in the horizontal-meridian threshold while on the diet are shown in Figure 3. In Case 1, this threshold increased only from 4.01 to 4.19 log units during the 30 days on the diet. This subject was not available for further tests after a normal diet was resumed. In Case 2, the diet was maintained for a period of 217 days. The highest threshold, 4.49 log units, was found in one of the three tests made before the diet was started; the lowest, 4.21 log units, after 195 days on the diet. It may be seen from the graph that there are irregular changes of small magnitude not related in any way to the dietary status. The average threshold based on all 12 tests is 4.35 log units with a mean variation of only ±0.08. In these two subjects the rate

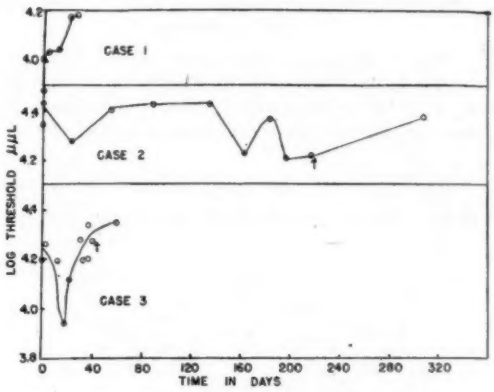

Fig. 3 (Sloan). Changes in threshold of three subjects on a diet deficient in vitamin A. The thresholds are the average of measurements at 19 locations in the horizontal meridian. Arrows indicate cessation of diet.

of dark adaptation likewise showed no significant change. In Case 3, while the changes in threshold are also of small magnitude there is some evidence that they are associated with the reduced intake of vitamin A. The drop in threshold during the first 18 days from 4.20 to 3.95 is probably a practice effect. From the 18th day onward there was a slight steady rise. On the 38th and 41st days the thresholds were 4.34 and 4.28 respectively. The changes in the adaptation curve paralleled those in the threshold gradient. After 19 days on a normal diet plus haliver oil, both curves were still about 0.4 log unit above the lowest previous level. Eighteen days later the adaptation curve had returned to its previous level. The threshold gradient was not determined on this date.

* This has been proved only in the case of thresholds for white light. When blue light is used, as in the Hecht adaptometer, the increased absorption of the shorter wave lengths of light by the lens in older subjects may be a factor.

† I am indebted to Dr. Lela E. Booher for the opportunity to examine Cases 4 and 5. They are reported as Case 1, and Case 3 in an article by Booher, Callison, and Hewston.[20]

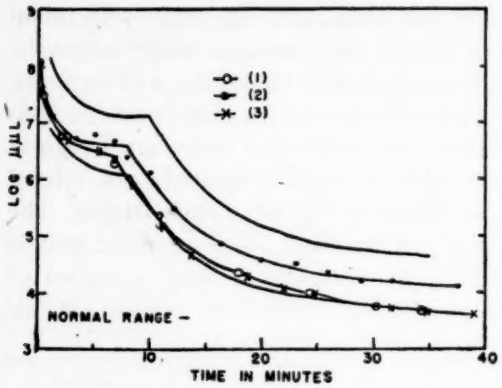

Fig. 4 (Sloan). Adaptation curves of Case 3. (1) After 18 days on diet deficient in vitamin A. (2) After 41 days on diet. (3) After 37 days on normal diet supplemented by haliver oil.

In Figure 4, the adaptation curves for three dates are charted to show the increase in threshold and subsequent recovery. It should be emphasized that the highest thresholds of this subject were well within normal limits. Consequently, even if the slight changes are considered to be related to the vitamin-A intake, it is questionable whether they can be interpreted as evidence of an actual deficiency in the clinical sense. None of the three subjects while on the diet deficient in vitamin A showed any significant change in the visual fields for a ½-degree white test object. In Case 2, tests were also made with 1-degree blue and red test objects and likewise showed no change.

Case 4, reported also in a previous paper,[8] after 42 days on the diet, showed marked elevation of the threshold gradi-

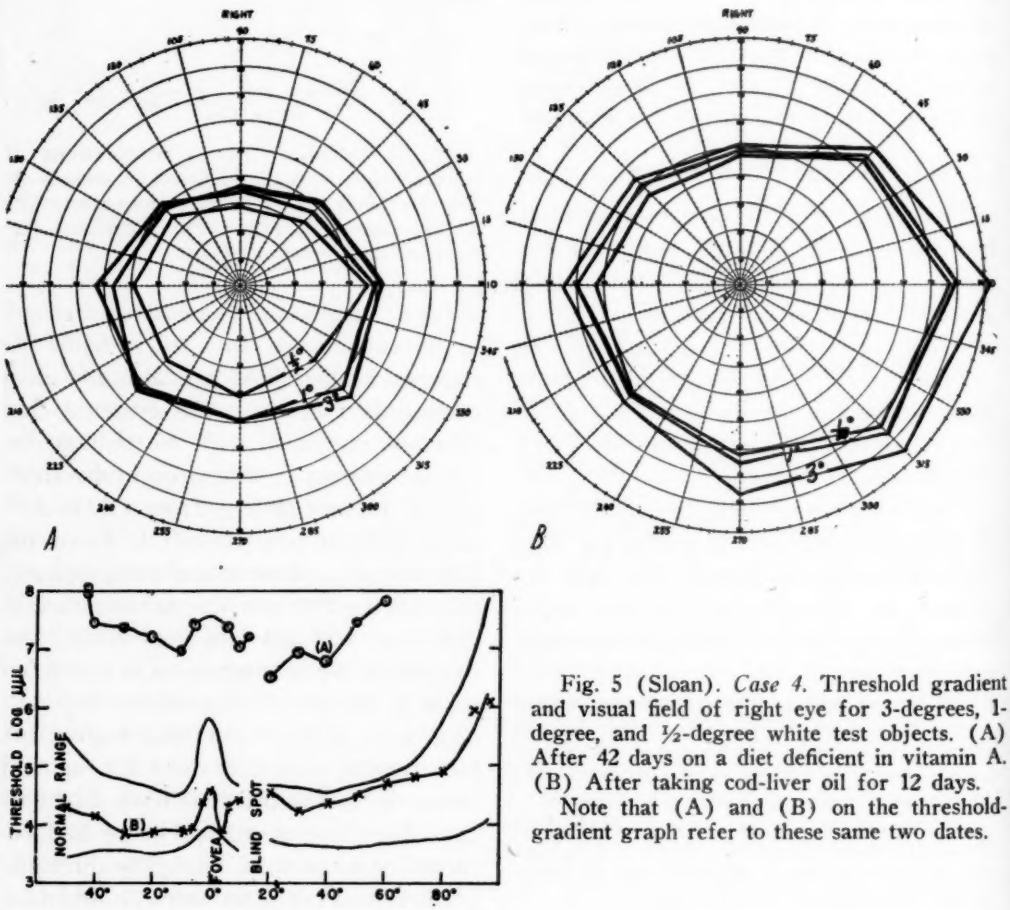

Fig. 5 (Sloan). *Case 4.* Threshold gradient and visual field of right eye for 3-degrees, 1-degree, and ½-degree white test objects. (A) After 42 days on a diet deficient in vitamin A. (B) After taking cod-liver oil for 12 days.

Note that (A) and (B) on the threshold-gradient graph refer to these same two dates.

ent (about 3 log units) and peripheral field defects in both eyes demonstrable with ½-degree, 1-degree, and 3-degree white test objects. The limits of the field for blue, tested only for the right eye, were normal, but within these limits there were small areas in which the blue test object disappeared completely. The location of these areas in the different meridians suggested that they were parts of a ring scotoma. The visual fields and the light threshold were normal when redetermined after the subject had been taking cod-liver oil for 12 days. Figure 5 shows the threshold gradient and the fields of the right eye for ½-degree, 1-degree, and 3-degree white test objects before and after vitamin A was restored to his diet.

Case 5, whose light threshold (horizontal-meridian average) had increased only 0.5 log unit after 91 days on the diet, had at this time defects in the peripheral fields similar to those of Case 4 but less marked. The visual fields of the right eye for a 1-degree white test object, prior to, during, and after the diet are shown in Figure 6. There was no significant change in the field for 1-degree blue.

Observations in clinical cases

Of nine patients examined, eight were referred because of visual symptoms suggesting poor night vision, one because of a skin condition suggesting a possible vitamin-A deficiency. With the exception of Case 11, these patients gave no history of any obvious inadequacy in diet. Four of the patients were examined at the Wilmer Institute; five, at the A.A.F. School of Aviation Medicine.* In two cases, the threshold gradient was within the normal range; in one case, close to the borderline normal curve; and in six cases, definitely above this curve in some or all regions. All nine patients showed significant improvement either on vitamin-A therapy alone or on vitamin A plus riboflavin.

Case 6. This patient was first aware of poor night vision while driving a car in the country at night some weeks after the birth of her first child. Examination showed that the threshold gradient and the adaptation curve were about 3 log units above the average normal curves (fig. 7) After three months on massive doses by mouth of vitamin A (90,000 I.U. per day), there was definite improvement. It will be noted in Figure 7 that the decrease in threshold was not of the same magnitude in different retinal regions. At 35 degrees in the temporal field, there was no change in the threshold, but at 10 degrees in the nasal field, there was a decrease of 1.5 log units. Since vitamin-A therapy had not resulted in complete recovery, the effect of 10 mg. per day of riboflavin was then tested.

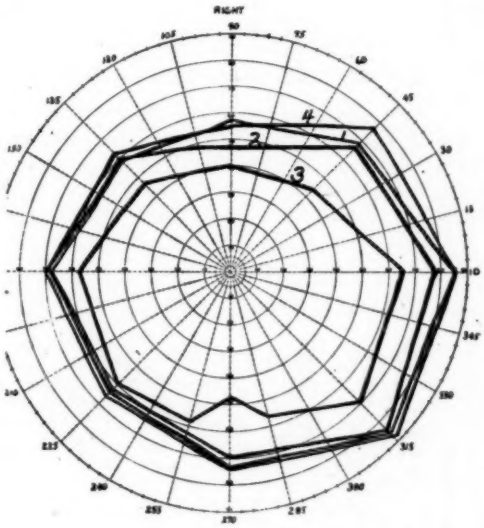

Fig. 6 (Sloan). *Case 5.* Visual field of right eye for 1-degree white test object. (1) Prior to diet deficient in vitamin A. (2) After 28 days on diet. (3) After 91 days on diet. (4) After administration of cod-liver oil for 35 days.

* Cases 10 and 11 have been reported in a previous paper by W. M. Rowland and the author.[21]

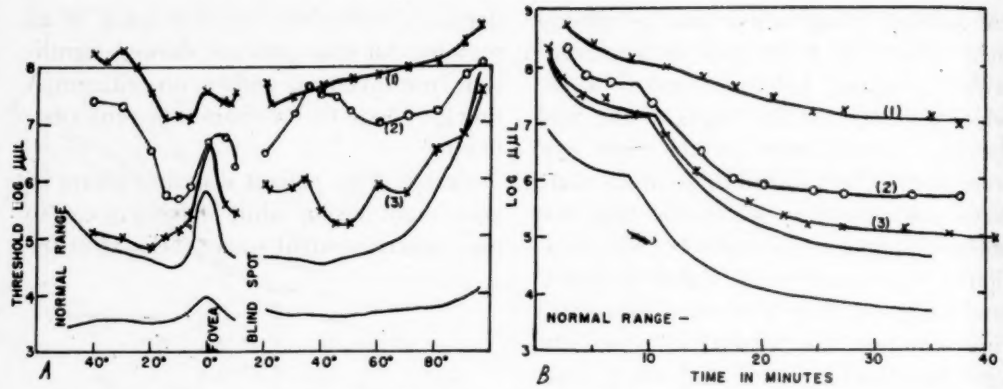

Fig. 7 (Sloan). *Case 6.* Progressive changes in threshold-gradient (A) and adaptation curves (B) of right eye. (1) October 18, 1940, prior to therapy. (2) January 7, 1941, after taking vitamin A for 3 months. (3) January 15, 1941, after taking riboflavin for one week. The daily dose was 90,000 I.U. of vitamin A; 10 mg. of riboflavin.

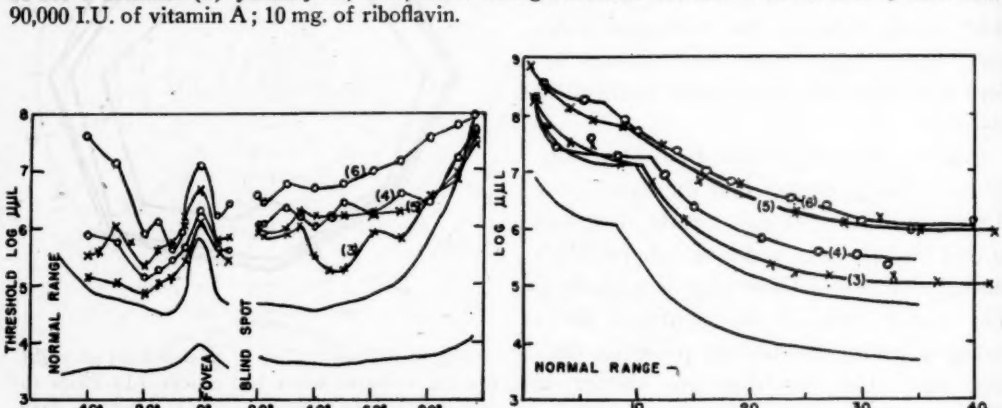

Fig. 8 (Sloan). *Case 6.* Progressive changes in threshold-gradient (A) and adaptation curves (B) of right eye after further therapy with riboflavin. (3) January 15, 1941. (4) January 17th. (5) January 20th. (6) February 26th. Vitamin A was discontinued on January 7th. Riboflavin therapy was started on January 7th; the entire B complex was started on January 20th.

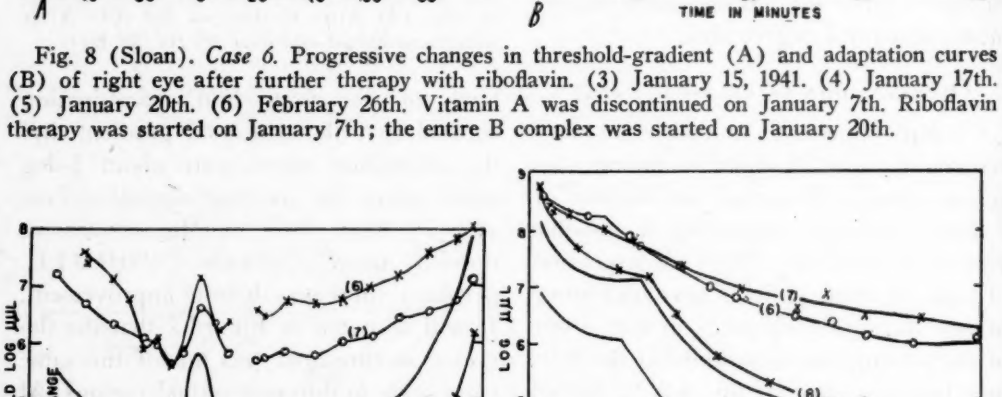

Fig. 9 (Sloan). *Case 6.* Progressive changes in threshold (A) and adaptation (B) curves of right eye during therapy with vitamin A and entire B complex from February 26 to June 1, 1941. (6) February 26th. (7) March 1st. (8) July 14th.

The first week after riboflavin was substituted for vitamin A, there were further improvements, marked in some retinal regions, slight in others. Riboflavin therapy without vitamin A for an additional six weeks (January 15th to February 28th), however, was accompanied by a gradual rise in the thresholds (fig. 8). The effect of treatment with vitamin A plus the entire B complex is shown in Figure 9. It may be noted that, although the adaptation curve measured at 15 degrees in the nasal field showed no significant change after three days, the threshold gradient revealed that there was significant improvement in other retinal regions.

The patient continued taking vitamin A and the B complex from February 26th until June 1st, when she stopped because subjectively her night vision seemed perfectly normal. She returned for retests on July 14th. On this date the adaptation curve was slightly above the borderline normal curve. The threshold, however, continued to decrease after 40 minutes of dark adaptation, reaching its lowest level which was well within normal limits only after 75 minutes of dark adaptation. The threshold gradient, determined after dark adaptation was complete, was close to the average normal curve. On this date, therefore, the only evidence of defective sensitivity to light was a slow rate of dark adaptation with no abnormality in the thresholds of the completely dark-adapted eye.

Figure 10 summarizes the changes in the horizontal-meridian threshold in relation to therapy throughout the entire period that this patient was studied. The visual field of the right eye was tested with ½-degree white and 1-degree blue test objects on January 15th, February 26th, and July 14th (fig. 11). On January 15th, only the field for blue was contracted but on February 26th the field for ½-degree white also showed concentric contraction similar to that noted in Case 4. The defect in the peripheral field found on February 26th but not on January 15th is consistent with the much higher peripheral light thresholds found on the second

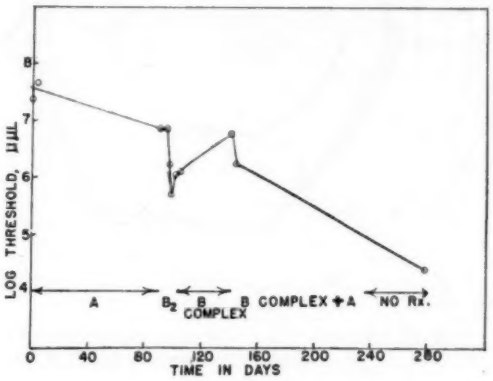

Fig. 10 (Sloan). *Case 6.* Changes in horizontal meridian threshold of right eye.

date. The concentration of vitamin A in the blood plasma, determined only on January 17th and February 26th, was well within normal limits on both dates (202 and 218 I.U. per 100 cc.). If the markedly elevated light thresholds noted on February 26th are considered to be definite evidence of an ocular vitamin-A deficiency, then it must be assumed that such deficiency can exist in association with adequate amounts of vitamin A in the blood plasma.

Case 7. This man, a member of the staff of the medical school, requested a dark-adaptation test because he was having some difficulty in seeing faint images on a fluorescent screen. Although both the adaptation curve and the threshold gradient were within normal limits, it seemed worth while to determine the effect of vitamin therapy. The changes in the horizontal-meridian threshold are shown in Figure 12. There was a temporary improvement with vitamin A alone and a sustained improvement with the ad-

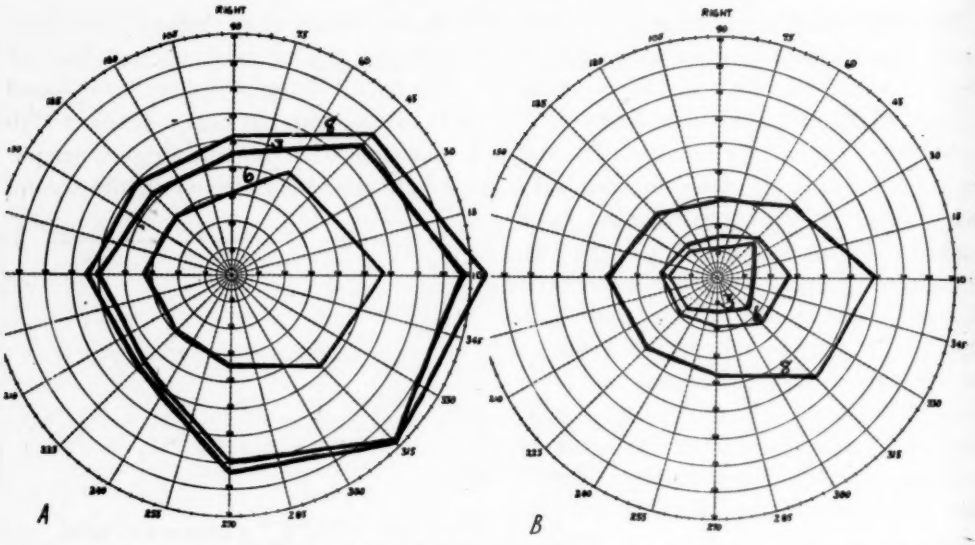

Fig. 11 (Sloan). *Case 6.* Visual fields of right eye. (A) For ½-degree white. (B) For 1-degree blue. (3) January 15, 1941. (6) February 26th. (8) July 14th.

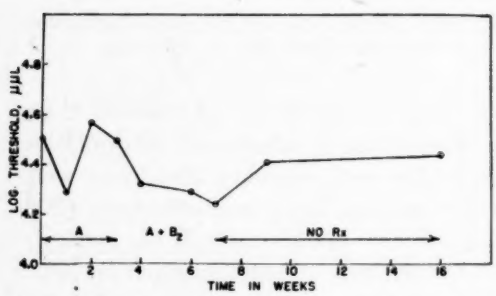

Fig. 12 (Sloan). *Case 7.* Changes in horizontal meridian threshold with vitamin therapy. The daily dose was 50,000 I. U. of vitamin A, 10 mg. of riboflavin.

dition of riboflavin, similar to that observed in Case 6. The visual fields were not tested. The maximum decrease in threshold was only about 0.3 log unit and the relationship to therapy is therefore somewhat doubtful in this case.

Case 8. This patient was referred by her doctor for light-sense tests because dryness and itchiness of the skin suggested a possible vitamin-A deficiency. The adaptation curve and the threshold gradient (fig. 13) were close to the bor-

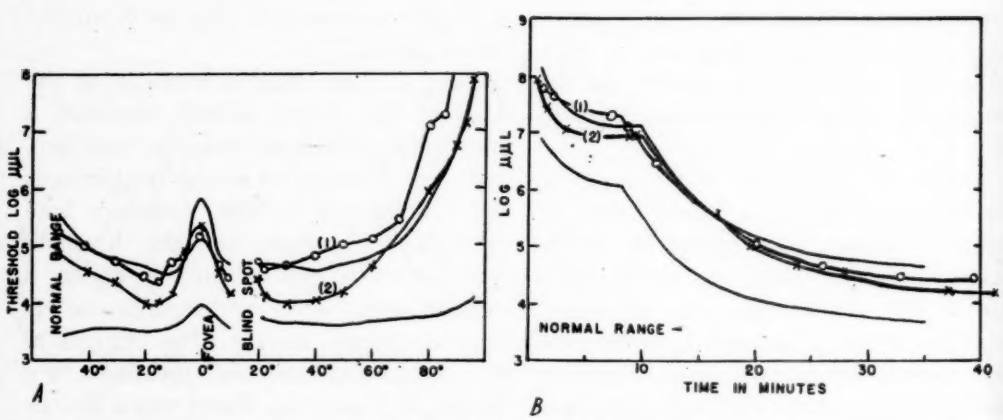

Fig. 13 (Sloan). *Case 8.* Threshold-gradient (A) and adaptation (B) curves. (1) Before treatment. (2) After one month on vitamin A, 200,000 I.U. per day.

derline of normal. The visual field for 1-degree white was normal. Other test objects were not used. After one month of vitamin-A therapy (200,000 I.U. per day) there was definite improvement in the threshold gradient, particularly in the far temporal field where the decrease was more than one log unit. The only significant change in the adaptation curve was a slight decrease in the final thresholds.

Case 9. This patient reported that for several years she had been unable to see as well as others in dim illuminations. The threshold gradient of the left eye was definitely elevated (fig. 14). At 30 degrees in the nasal field, for example, the threshold was 1.6 log units above the average normal value. After she had taken vitamin A for 17 days, a recheck of the thresholds in the nasal field gave essentially the same results at 6 degrees, 10 degrees, and 15 degrees, but at 20 degrees, 30 degrees, and 40 degrees showed a decrease of 0.7, 1.3, and 1.2 log units respectively. The visual fields of both eyes, tested on this date revealed marked

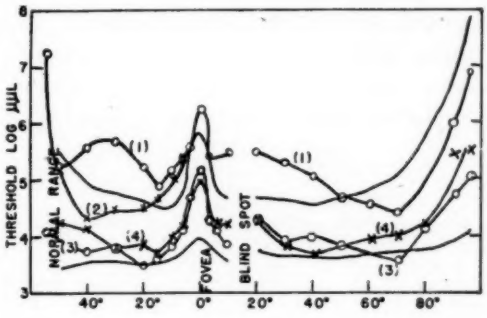

Fig. 14 (Sloan). *Case 9.* Threshold gradient of left eye. (1) Before treatment. (2) After 27 days on vitamin A. (3) After 9 weeks on vitamin A. (4) After 4 months without treatment. The amount of vitamin A per day was not recorded.

concentric contraction for white test objects and moderate contraction for a 1-degree blue test object. The fields of the left eye are shown in Figure 15. After 9 weeks of vitamin-A therapy, the threshold gradient and the visual fields were within normal limits. Four months without vitamin A did not result in any significant increase in the thresholds.

Case 10. Prior to vitamin therapy, the

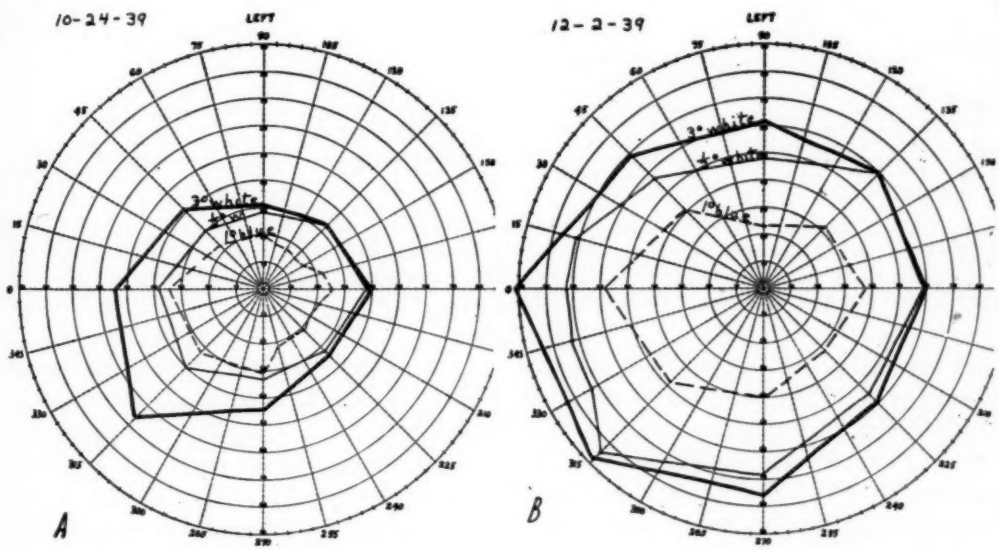

Fig. 15 (Sloan). *Case 9.* Visual fields of the left eye for 3-degrees white, ½-degree white, and 1-degree blue. (A) October 24, 1939, after 17 days on vitamin A. (B) December 2, 1939, after 9 weeks on vitamin A.

thresholds were elevated throughout the entire horizontal meridian. The adaptation curve showed a normal rate of dark adaptation with elevation only of the final units before treatment; 4.5 and 4.2 after three and four months of vitamin therapy.

Case 11. This patient, while subsisting entirely on emergency rations, had lost

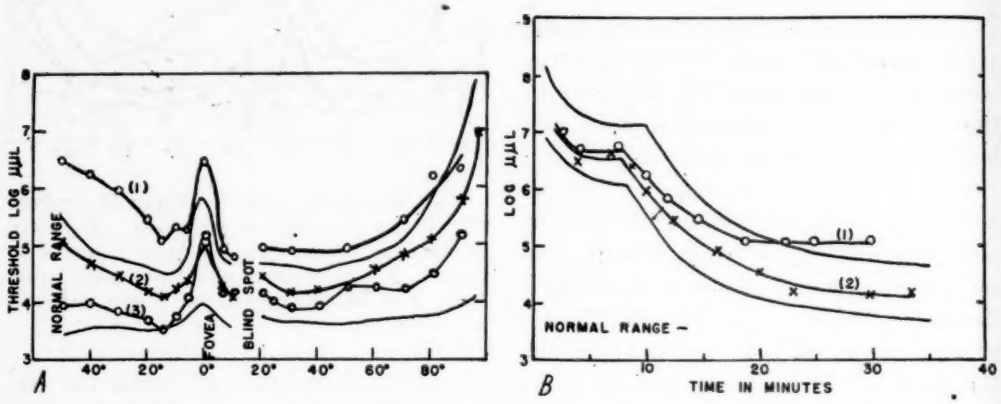

Fig. 16 (Sloan). *Case 10.* Threshold-gradient (A) and adaptation (B) curves. (1) Before vitamin therapy. (2) After daily doses of 100,000 I.U. of A, 5 mg. of B_2 for 3 months. (3) After 4 months on this regime.

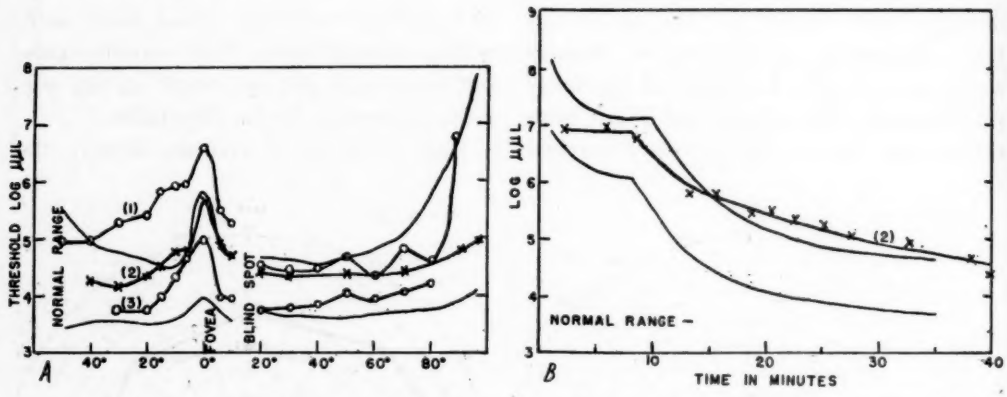

Fig. 17 (Sloan). *Case 11.* Threshold-gradient (A) and adaptation (B) curves. (1) After taking vitamins A and D, amounts unknown. (2) After 3 weeks on 100,000 I.U. of vitamin A, 8,000 units of vitamin D per day. (3) After 5 weeks during which the B complex including 3 mg. of riboflavin per day was taken in addition to vitamins A and D.

threshold about one log unit above average normal (fig. 16). After daily doses of 100,000 I.U. of vitamin A and 5 mg. of riboflavin for three months the threshold gradient and the adaptation curve were within normal limits. There was further improvement after an additional month of the same treatment. The average horizontal-meridian threshold was 5.5 log

weight and appetite and developed marked symptoms of night blindness. For some weeks prior to our first examination of the patient, he had been on a normal diet supplemented by vitamins A and D in undetermined amounts. His threshold gradient was elevated almost 2 log units above average normal in the paracentral nasal field. (fig. 17). After he

had taken 100,000 I.U. of vitamin A and 8,000 units of vitamin D for three weeks, there was definite improvement. The adaptation curve at this time showed an abnormally slow rate but a final threshold close to the borderline normal value. The threshold gradient showed a further decrease five weeks later after treatment with vitamins, A, D, and the B complex, including 3 mg. of riboflavin per day.

Case 12. This patient had also taken vitamins A and D prior to the first examination. The thresholds (fig. 18) were elevated in some regions, normal in others. After three months on a regime of 25,000 I.U. of vitamin A and 5 mg. of riboflavin per day, there was definite improvement and the entire curve was within the normal range. The maximum decrease occurred at 6 degrees in the temporal field where the threshold fell from 5.40 to 4.05 log units.

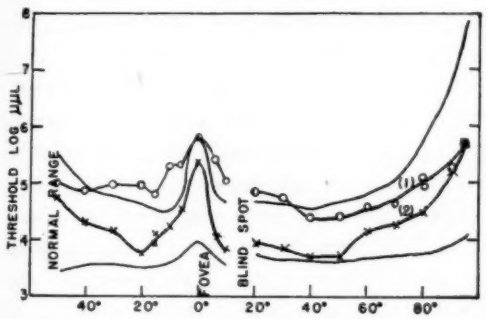

Fig. 18 (Sloan). *Case 12.* Threshold gradient curves. (1) After taking vitamins A and D, amounts unknown. (2) After daily doses of 25,000 I.U. of vitamin A, 5 mg. of B_2 for 3 months.

Case 13. This patient had taken vitamin A prior to the first examination. The threshold gradients of both eyes were determined (fig. 19). That of the right eye was close to the borderline normal curve while that of the left eye revealed much more marked defects in some regions. At 60 degrees in the temporal field, for example, the threshold was 2.4 log units above the average normal value. After three months on daily doses of 50,000 I.U. of vitamin A and 5 mg. of riboflavin the threshold gradients of both eyes were essentially the same and were within the normal range.

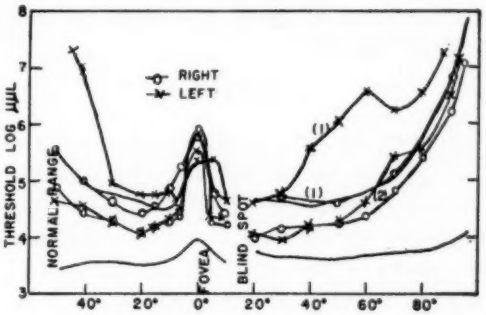

Fig. 19 (Sloan). *Case 13.* Threshold gradients of right and left eyes. (1) After taking vitamin A, amounts unknown. (2) After daily doses of 50,000 I.U. of vitamin A, 5 mg. of B_2 for 3 months.

Case 14. This patient had a threshold gradient (right eye) within normal limits (fig. 20). The left eye was not tested. He had not taken any vitamin supplements prior to the first examination. After 7 and 13 weeks, during which time he took 100,000 I.U. of vitamin A and 5 mg. of riboflavin per day, retests showed a threshold gradient close to the lower normal level, indicating better than average normal sensitivity. The average

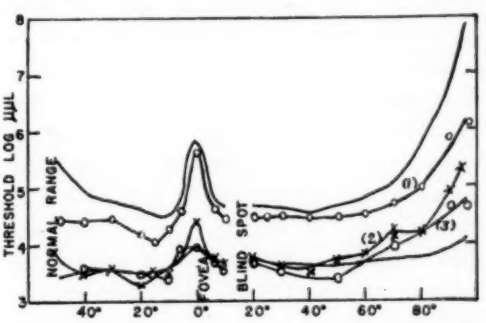

Fig. 20 (Sloan). *Case 14.* Threshold gradients. (1) Prior to vitamin therapy. (2) After daily doses of 100,000 I.U. of vitamin A and 5 mg. of B_2 for 7 weeks. (3) After 13 weeks on this regime.

decrease in threshold following therapy was 0.8 log unit.

Comments

In two patients in this study (cases 6 and 11) increased rod thresholds during the earlier stages of dark adaptation were observed on one occasion when the final threshold of this same retinal region was within normal limits. In general, however, our findings are in agreement with the accepted view that in vitamin-A deficiency the light threshold of the fully dark-adapted eye is increased earlier and to a greater extent than the thresholds measured during the course of dark adaptation. Our results also show that the final threshold of the dark-adapted eye may be normal in some retinal areas, elevated in others. The improvement which follows vitamin-A therapy may likewise occur earlier or may be more marked in some areas than in others. Tests of the light sensitivity of only a single retinal region may therefore fail to reveal defects or to detect improvement in retinal function following therapy.

Because of the relatively wide range of normal variation in threshold, it is possible for an individual whose optimal threshold gradient is close to the lower limit of normal to have an increase in thresholds of as much as one log unit above his own normal level and still be within the normal range. Two such cases were observed in this study (cases 7 and 14) and were diagnosed as deficient in vitamin A from the fact that significant improvement in thresholds followed vitamin therapy. It has been my experience that subjects with normal thresholds do not as a rule show any significant decrease in thresholds when large amounts of vitamin A are administered. When such improvement does occur, therefore, it is reasonable to suppose that the previous level, although within the normal range, was not normal for the individual in question.

Of our nine subjects with visual defects responding to vitamin therapy, only one gave a definite history of a previously inadequate diet. In the one case in which determinations were made of the vitamin-A content of the blood, normal values were found in association with fairly marked elevation of the light thresholds. If we accept as evidence of an ocular vitamin-A deficiency elevated rod thresholds which return to normal following therapy, then we must admit that individuals ingesting a diet containing adequate amounts of vitamin A, who have a normal concentration of vitamin A in the blood and no evidence of deficiency elsewhere in the body, can nevertheless have an insufficient supply of vitamin A in the retina or a deficient ability to utilize it.

Conversely it is possible, at least for some individuals, to subsist for many months on a diet containing very little vitamin A, but adequate in other respects, without showing ocular or other evidence of a deficiency. While it is probable that in such subjects the liver reserves are drawn upon to replace what is lacking in the diet, it is not clear why these reserves do not prevent the development of visual defects in other subjects. The possible role played by riboflavin needs further study to determine whether it has a direct effect on retinal function or merely has some influence on the ability of the retina to utilize vitamin A. In 7 of the 9 cases reported in this study, riboflavin and vitamin A were given and in at least one case there is definite evidence that simultaneous use of both vitamins was necessary to restore the thresholds to normal.

Concentric contraction of the peripheral isopters of the visual field without other evidence of pathologic conditions of the eye is often attributed to poor cooperation of the patient, hysteria, and so

forth. The findings of this study suggest that in such cases the possibility of a vitamin-A deficiency should also be considered.

Visual-field studies alone, however, cannot be considered adequate to detect all cases of vitamin-A deficiency. Defects demonstrable by the usual perimetric tests are sometimes, but not always, present when the thresholds of the dark-adapted rods are increased. A close parallel is not to be expected between these thresholds and the extent of the visual field, since the latter is normally determined when the eye is adapted, not to complete darkness, but to a low level of brightness. In the Ferree-Rand perimeter, for example, the brightness of the perimeter arc is approximately 0.7 millilambert. Studies now under way in this laboratory indicate that at this level of light adaptation the rod and cone thresholds of the normal eye in a given retinal region are approximately equal. A significant contraction of the visual field would, therefore, be expected when both cone and rod thresholds were elevated but might not occur when only the rods or only the cones were affected.* Previous studies of the adaptation curve in experimental vitamin-A deficiency[18, 23] have shown that a slight increase in the final cone threshold usually accompanies a marked elevation of the rod section of the curve. When visual-field defects are observed in patients with vitamin-A deficiency it is probable, therefore, that the cone as well as the rod thresholds of the far periphery are significantly increased.

* Confirmation of this is found in the fact that in two cases of typical achromatopsia (a condition in which there is, presumably, complete loss of cone function with normal rod function), I found entirely normal fields for a 1-degree white test object. A case of incomplete achromatopsia, reported previously[22] has, in addition, an abnormally slow rate of dark adaptation and an elevated threshold gradient similar to those of patients with vitamin-A deficiency. This subject, who apparently has dysfunction of both cones and rods has also a concentrically contracted field for a 1-degree white test object.

Summary and Conclusions

1. Data are given showing the range of variation among normal subjects in (a) the dark-adaptation curve of a single retinal region and (b) the threshold gradient of the fully dark-adapted eye in the horizontal meridian of the retina.

2. The same tests were given to five subjects on diets low in vitamin A. Two showed no significant change in the adaptation curve or the threshold gradient after 30 and 195 days respectively on the diet; two showed only slight increase in the thresholds after 41 and 91 days; and one showed a very marked rise in the thresholds after 42 days. Two of the five developed concentric contraction of the visual fields which returned to normal after vitamin A was restored to the diet.

3. Studies were also made of nine patients with elevated light thresholds which were restored to normal following vitamin therapy. The findings indicate that riboflavin in addition to vitamin A may sometimes be required to bring about complete recovery.

4. The results of these studies suggest that concentric contraction of the visual field occurs frequently in patients with ocular vitamin-A deficiency and probably indicates cone as well as rod involvement.

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THE INFLUENCE OF GENERAL METABOLIC AND NUTRITIONAL DISTURBANCES UPON THE RESISTANCE OF THE CORNEA

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The corneal stroma is one of the strongest and most resistant tissues of the human body. Anyone who has made a corneal puncture with a very sharp needle knows how much effort is required to push the needle through the stroma, how the cornea is indented during this procedure, and how the needle becomes anchored within the tissue, which resists advancement of the needle through the cornea.

The cornea is also relatively resistant to infections. Severe purulent conjunctivitis does not always damage the cornea, and there is rarely a bacterial invasion of the stroma in corneal erosion, not even in the recurring type, in which very extensive epithelial defects occur. The most dangerous abrasions and traumas due to small foreign bodies are, perhaps, those which dentists encounter during the removal of calcareous deposits. The smallest lesions of this kind often lead to the most destructive corneal infections.

The relatively great resistance of the corneal stroma to infections is particularly surprising in view of the absence of blood vessels, which in other tissues represent the main defense mechanism. The basis for this unexpected resistance to infection is, on the one hand, the density and compactness of arrangement of the rather firm corneal fibrillae which permit only small amounts of fluid in the interstitial spaces, and, on the other hand, the constant flow of lacrimal fluid which cleanses mechanically and which, through its lysozym content, also has some bactericidal power.

It may be surprising, therefore, that under certain circumstances the resistance of the corneal parenchyma is considerably diminished and that this diminution is due to general metabolic and nutritional disturbances.

CONDITIONS OF LOWERED CORNEAL VITALITY

Various groups of conditions will be discussed in which a lowered corneal vitality and lack of resistance to external damage and infection have been observed.

CASES OF LAGOPHTHALMOS

1. In some cases of complete lagophthalmos, the cornea may remain intact. This is especially true in those instances in which the facial nerve has been severed during operations on the ear or parotid gland. In these cases, the cornea may remain completely exposed during sleep and yet, surprisingly, no hyperemia of the bulbar conjunctiva, no corneal damage, nor increased lacrimal flow develops. Facial paresis from other causes leads more frequently to keratitis e lagophthalmo. Rheumatic facial paresis, however, is soon followed by excessive lacrimation which prevents the drying out of the cornea and the development of lagophthalmic keratitis in a high percentage of cases without other preventive measures.

In some contrast to the above mentioned causes of lagophthalmos there is the congenital, often familial ptosis, with shortness of the upper lids, which prevents complete closure of the palpebral fissure. These patients frequently require a ptosis operation. Great care should be exercised to elevate the upper lid just enough

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to enable the patient to look straight ahead without having to throw his head backward, because due to the preëxisting shortness of the lids the postoperative lagophthalmos is considerable and leads often to lagophthalmic keratitis in later years. In common cases of ptosis, the postoperative lagophthalmos is of such low degree that it does not often cause complications even in later life.

In all types and degrees of lagophthalmos, even the most complete, the innate vitality and great resistance of the cornea may prevent corneal complications. It is different if the lagophthalmos is associated with general debility and nutritional disturbances, as illustrated by the following cases.

Case 1. A woman, aged 20 years, received antisyphilitic therapy with Salvarsan. Almost immediately she developed a generalized dermatitis and was placed in the continuous bath. Gradually the severely damaged skin was replaced by fine, diffuse, shiny, pink scar tissue, which caused some shrinkage of the lids and a slight lagophthalmos of about 1 to 1.5 mm. In spite of this low degree of lagophthalmos and a normal Bell's phenomenon, bilateral lagophthalmic keratitis with rapidly progressing ulceration developed. Because of the skin condition neither bandage nor moist-chamber dressing was tolerated. One eye was lost following perforation of the ulcer and endophthalmitis; the other eye retained some useful vision in spite of perforation of the ulcer and iris prolapse. During the same period in which I observed this case, two similar cases of corneal destruction after Salvarsan poisoning were reported, one by Hegner[1] the other by Erggelet. Both[2] patients had severe Salvarsan dermatitis which ended lethally. In one patient, the cornea melted away completely; in the other, circumscribed defects developed which became epithelialized again. In neither patient was lagophthalmos mentioned, although it probably was present but of such slight degree that it was overlooked by the dermatologist.

Such rapid dissolution of the cornea does not occur in the ordinary cases of mild lagophthalmos, unless a severe nutritional disturbance due to poisoning and general debility is associated with it.

Another kind of low-grade lagophthalmos is not unusual in moribund patients. Although usually not more than 1 or 2 mm. of the cornea are exposed, lagophthalmic keratitis is not too rare in these patients. Most of the histologic specimens of this condition in my collection are from such patients. Perforation of these ulcers is rare, as the patients usually die before it occurs. The following case is of this type, and will be discussed in detail because it proves that it is indeed the general debility which predisposes to this rapid corneal disintegration and because it gives some useful hints for effective therapy.

Case 2. A man, 58 years of age, suffered a severe attack of pneumonia in addition to a nervous disorder with disturbances of equilibrium. When I first saw him, he was completely apathetic and was lying as if moribund with incompletely closed palpebral fissures. There was marked bilateral ciliary injection of the lower bulbs, and corneal infiltrates (1 by 3 mm.) had developed near the lower limbus in both eyes. Therapy for two weeks with atropine, oxycyanate of mercury (1:4,000 solution), and boric-acid ointment did not improve the ocular condition. The general condition of the patient also remained unchanged. I then ordered daily intramuscular injections of Vogan (vitamin A). When I saw the patient again a week later, he was sitting up in bed; the bulbs were pale, and shiny facettes had replaced the former corneal infiltrates.

This case of lagophthalmic keratitis in a critically ill patient responded strikingly to intramuscular vitamin-A therapy although no outward signs of avitaminosis were present. The severe illness had caused general nutritional disturbances in spite of the adequate food intake. The injections proved strikingly beneficial not only upon the ocular but also upon the general condition.

Cerebral hemorrhage and corneal disease

2. A different type of corneal disease is illustrated by the following case.

Case 3. An old woman had suffered a cerebral hemorrhage followed by paralysis of the right side. There was marked general debility and severe pulmonary congestion due to myocardial degeneration. There was a marked spastic entropium of the lower lids, and in the right eye the inverted cilia had caused a corneal perforation with iris prolapse and purulent iritis instead of the superficial keratitis more common in this condition.

In this case the severe general disease had led to the unusual complications of corneal perforation and iris prolapse in a spastic entropium. There was, apparently, not only an unusual lack of resistance of the corneal stroma but also a decreased corneal sensitivity; otherwise, the patient would have directed the attention of the attending physician toward the eye sooner.

Marantic corneal ulcers

3. Marantic ulcers of the cornea are closely related to the above mentioned cases. These ulcers develop in debilitated patients with such severe hepatic diseases as carcinoma or cirrhosis. They are flat, rather torpid ulcers, which do not change their appearance rapidly, cause only mild ciliary injection, and are accompanied by a stringy conjunctival secretion. The bulbar conjunctiva has often the appearance of tissue paper and, occasionally, Bitôt's spots, which have the appearance of dried soap foam, develop in the interpalpebral area, just as in keratomalacia and hemeralopia. These patients are usually icteric and their scleras are yellow. In severe cases, such marantic ulcers may lead to destruction of the cornea.

The corneal lesions in the two groups of cases described above are not due to lack of vitamin A in the food but to lack of utilization of the ingested vitamin. There appears to be a barrier between the intestinal tract and peripheral organ and intramuscular administration of vitamin A would seem to be a logical and promising therapy.

Keratomalacia

4. Closely related to the marantic ulcer is keratomalacia. It is mostly a disease of poorly nourished, ill, and weakened babies, and therapy with vitamin A is general.

It is considered by many, and in my opinion justifiably so, as a primary necrosis of the corneal lammellas with secondary invasion of bacteria from the conjunctival sac. Such eyes appear dry; the lacrimal fluid is diminished and its mechanically cleansing and bactericidal influence is, therefore, lacking.

The cause of this nutritional disturbance of the cornea is a generalized metabolic disturbance, often not a real lack of vitamin A but a lack in certain tissues of proper utilization of the vitamin and its metabolic derivatives. In the eye, the bulbar conjunctiva, cornea, and pigment epithelium are affected. The conjunctiva becomes dry and looks like wrinkled tissue paper, and Bitôt's spots appear. In the cornea, there develops a large, rapidly disintegrating infiltrate; the disturbance of the pigment epithelium manifests itself in hemeralopia. The finer and rarer lesions,

such as pigmentation of the cornea and white punctate lesions of the fundus, will not be discussed here.

A patient, whom I saw and treated in 1927, at a time when no parenteral vitamin therapy was as yet available, demonstrated that at least in some cases lack of utilization of the vitamin and not lack of its ingestion is responsible for keratomalacia.

Case 4. A baby, six weeks of age, was fed partly with mother's milk, partly with cow's milk, and looked well in general. Four days prior to the first visit, bilateral opacities were noted. At the time of this visit, there was already a small perforation in the lower half of each cornea and marked xerosis of the conjunctiva. Ultraviolet irradiation of back and abdomen was begun immediately, at first for three minutes a day at a distance of 60 cm. The feeding remained the same. Gradually the time of irradiation was increased. On the fifth day, the mother's breasts and the cow's milk were also irradiated. Within three weeks, the conjunctival xerosis had disappeared, the ulcers were healed, the anterior chambers restored, and the child, who had also suffered during this time from severe bronchitis, had gained 700 gm. It appears that the amount of vitamin already present in the milk became somehow activated and effective through the irradiation.

Another illustration in favor of poor utilization of the vitamin rather than its actual lack is the distribution of keratomalacia in India. I found keratomalacia widely distributed throughout Asia, from Palestine to Japan, occurring sometimes in children 5 and 6 years of age, but mostly in babies. In Japan about 20 percent of blindness is due to this disease. However, in the state of Mysore in India, which is an especially well-governed district where one gets the impression of a high standard of living, keratomalacia is not infrequent in pregnant women or soon after parturition. These women often lose the sight of both eyes, while their babies develop neither xerosis nor keratomalacia. They frequently do not belong to the poorer classes and seem well nourished. I have neither seen nor heard of similar cases in any other province of India.

These cases show clearly, in my opinion, that there is not merely a simple lack of vitamin A, but a disturbance in the utilization of the vitamin. The ulcer in keratomalacia is not characterized by invasion of any one type of bacteria; therefore, the assumption that one is dealing primarily with a nutritional disturbance of the cornea as the consequence of a general metabolic disturbance is justified.

Basedow's disease

5. In rare instances of Basedow's disease, the proptosis is so marked that the lids no longer cover the cornea, and lagophthalmic keratitis develops. In these cases one attempts to protect the cornea by a moist-chamber dressing, a tarsorrhaphy, or, in severe cases, by a tenotomy of the levator palpebrae in order to release the severely retracted upper lid.

The severest degrees of exophthalmos sometimes follow a thyroidectomy, appearing from two months to a year after the operation, and are often associated with papilledema, retinal lesions, and impairment of vision. In these cases it is indicated to remove the roof of the orbit and of the optic canal and sever the tendon ring of Zinn. The exophthalmos may diminish in the course of several months. Naffziger[3] found in these cases a waxy and hyalin degeneration of the muscle fibers and some infiltration of the muscles with lymphocytes and plasma cells. In these cases the cornea is damaged not only through desiccation but also through a nutritional disturbance. The latter is partly general and partly local. It is caused by the marked exophthalmos which is accompanied by severe chemosis

and swelling of the lids. The cornea may melt away rapidly in spite of a moist-chamber dressing, and it is in these seemingly hopeless cases that Naffziger's operation may be advised.

Case 5. A woman, 35 years of age, suffered from Basedow's disease and had lost 30 pounds. Professor Kaspar, who performed the thyroidectomy, found part of the gland liquefied and the fluid, which was under pressure, spouted a meter high after the section. During the night following the operation, severe dyspnea necessitated a tracheotomy. Several months after the operation, the already proptosed eyes became still more prominent and a tarsorrhaphy was performed. This was not tolerated by the patient for long, as the chemosis and exophthalmos increased further. The left cornea melted away rapidly and, in the fourth postoperative month, the right cornea also began to show infiltration in spite of a meticulously applied moist chamber and therapy with Vogan and pituitary preparations. At this stage, I saw the patient for the first time. There was maximal proptosis and chemosis of the bulbar conjunctiva. In the right cornea, there was an ulcer 5 by 6 mm. in size, whose margins showed yellowish infiltration and whose floor bulged forward. The pupil was maximally dilated, but there was no hypopyon. The left cornea had already melted away, and the left eye was very soft. I advised irradiated milk and Anthithyreoidin. I heard later that the right ulcer perforated but did not progress so that portions of the cornea were preserved. The left eye developed an applanation of the cornea and became blind.

In this case I did not advise Naffziger's operation because the corneal damage was so advanced, had progressed so rapidly, and the corneal ulcer in the better eye was just about to perforate.

Undoubtedly the rapid disintegration of the cornea was partly the consequence of the severe local circulatory disturbance, and partly due to the severe general toxic condition of the patient.

Eczematous conjunctivitis

6. In very run down and anemic children, eczematous conjunctivitis sometimes leads to destructive corneal ulcers. These ulcers are not caused by infection, and it is difficult to explain them solely on an allergic basis, which presumably is the main factor in eczematous conjunctivitis. I often saw such corneal infiltrates and ulcerations in adults whose general health was below par. In these patients, who are usually quite anemic, underweight, and often have multiple lymphomas, the generally weakened physical condition seems to be responsible for a diminution of the resistance and vitality of the cornea, as the following case illustrates.

Case 6. A man, 40 years of age, sustained a severe pulmonary injury during the war and was operated for empyema. The patient was in a generally feeble condition and undernourished. There was eczema of the face and eyelids and a marked bilateral conjunctivitis, associated in the right eye with a corneal infiltrate and in the left eye with a small, deep, crater-shaped ulcer. The eczema was successfully treated with cehasol paste, the conjunctivitis with oxycyanate of mercury and novargan ointment, but the ciliary injection of the bulb remained the same in spite of intensive atropine medication, which did not succeed in dilating the pupil appreciably within two weeks. Finally, I ordered pyramidon, 0.2 gm., six times daily. After two days, the ocular condition had improved considerably; the eyes could be opened; the bulbs were pale; and the corneal ulcers were cleansed and epithelialized. The eczema of the face had disappeared completely. The pyramidon medication was discontinued, but within two days, the ciliary injection of the bulbs reappeared and the left, already epithe-

lialized, crater-shaped ulcer had perforated, leading to a small iris prolapse.

The condition of the eyes was such as one encounters not infrequently in cases of severe eczema of the face, and which resembles eczematous conjunctivitis. The fact that an ocular condition of this type is so refractory might be due to an altered mode of reaction of the entire ectoderm of the body. The unusual and late perforation of the already cleansed ulcer was probably not due to allergy but to a diminished vitality of the cornea in the course of the debilitating general illness. In this case the prompt effect of the cumulative doses of pyramidon is also noteworthy.

In the therapy of eczematous keratitis, one obviously has to distinguish between measures which are directed against the allergic condition of children and adolescents, in whom often a simple foreign body elicits a typical attack of eczematous conjunctivitis with phlyctenules and pannus, and the general hygienic measures as mud and seabaths, and cod-liver oil, iodine, iron, and quinine medication which, by raising the general physical resistance, also increase the vitality of the cornea.

Discussion

In these six groups of cases there is a diminution of corneal resistance due to a general weakening of the connective tissue of the body, and it is interesting to point out analogous conditions in other parts of the body.

There is the reopening of the postoperative wound and evisceration after abdominal surgery. Large, collective statistics show that this occurs in 2 to 3 percent of all laparotomies, and is almost twice as frequent in men as in women. It occurs predominantly in patients who suffer not only from the current surgical condition but also from general cachexia, acute or chronic toxic conditions, or considerable anemia (Hofstätter[5]). Other predisposing diseases are diabetes, syphilis, and avitaminosis. Many authors have reported this surgical complication as occurring in years of famine and as more frequent at certain times of the year, late winter and early spring, when nutrition becomes poorer. Only in rare instances is this reopening of abdominal wounds ascribed to faulty suturing technique or inferior suture material. Most authors believe that a diminished "tissue tone," delayed healing tendency, or "tissue paralysis" due to general debility are responsible for it.

I believe that there is an inherent weakness, fragility, and striking lack of resistance of the connective-tissue fibrillae rather than an absence of healing tendency.

The frequent occurrence of hernias in times of famine has a similar pathogenesis; that is, general damage to the connective tissue apparatus. These hernias have become very common during the past few years and often occur in people who have remained physically fit through continuous gymnastic exercise. Many surgeons consider the rapid and considerable loss of weight and the consequent loss of lipoid tissue in the abdominal wall as the cause of these hernias. It is, however, not very obvious how lipoid tissue should strengthen the abdominal wall to such an extent. It is more probable that, in the course of marked loss of weight due to malnutrition, the connective-tissue fibers are weakened and that this leads to thinning and dehiscences especially in such places of naturally weaker resistance as the inguinal canal. The pathogenesis of the above discussed manifestations of corneal and of general disease appear to be the same; namely, a striking diminution of the vitality of the connective-tissue apparatus.

UNRRA Headquarters

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SCLERAL NECROSIS IN PERIARTERITIS NODOSA

A CASE REPORT*

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AND
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Periarteritis nodosa was first described by Rokitansky in 1852.[1] In 1866, Kussmaul and Maier described the gross and microscopic pathology of the disease. Since that time more than 550 cases have been reported and of these only 10 percent exhibited ocular involvement.[2,3]

Goldsmith has recently reviewed the ocular signs of periarteritis nodosa.[4] These include papilledema with optic atrophy, involvement of the choroidal vessels, involvement of the retinal vessels with the formation of fusiform aneurysms, retinitis with retinal detachments, hemorrhages and exudates, recurrent vitreous hemorrhages, and involvement of the extraocular muscles.[6-11] A survey of the literature reveals no report of scleral necrosis occurring in the course of this disease.

REPORT OF A CASE

G. H., aged 31 years, was first admitted to the U. S. Naval Hospital at Philadelphia on April 11, 1946, with the complaint of weakness, headache, and anorexia. The present illness apparently began two years prior to admission when the patient, an enlisted man in the Army, developed an acute otitis media and abscess of the nasal septum. While under treatment with sulfonamides, the patient developed what was thought to be an allergic reaction to them. One blood culture out of many prior to treatment was reported positive for hemolytic staphylococcus aureus. The patient recovered from this acute episode with considerable nasal saddleback deformity due to loss of cartilage, chronic right dacryocystitis, and deafness, which necessitated the use of a hearing aid. In February, 1945, he developed an interlobar collection of fluid in the right chest and an exacerbation of chronic dacryocystitis. Cultures and guinea-pig inoculations of the pleural fluid were reported negative. Both lesions cleared with penicillin therapy, and the patient was asymptomatic until just prior to admission.

PHYSICAL EXAMINATION

Positive findings on admission were an interlobar collection of fluid in the right chest, chronic right dacryocystitis with fistula formation, marked saddleback de-

* Read at College of Physicians of Philadelphia, Section on Ophthalmology, October 24, 1946.

formity of the nose, large perforation of the nasal septum, and marked atrophy of all turbinate tissue with nasal crusting and tendency toward spontaneous epistaxis. The right ear drum was markedly retracted with recent vascularization, and the left drum showed an old perforation with adherence of the drum margins to the medial wall of the middle ear. Repeated sputum examinations were negative for tubercle bacilli and careful study showed no evidence of active pulmonary infection. Vision was: O.D., 20/20; O.S., 20/15. No pathologic condition of the eyes was noted. The patient desired a nasal plastic operation, and a dacryocystectomy with excision of the fistulous tract was performed on May 1, 1946, as a preliminary to rhinoplasty.

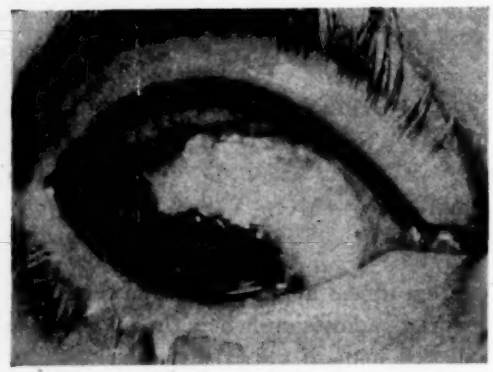

Fig. 1 (Harbert and McPherson). Right eye. Showing extensive, sharply demarcated, superficial necrosis surrounded by chemotic conjunctiva. Cornea clear.

COURSE

The immediate postoperative course was uneventful; the wound apparently healed by primary intention, and sutures were removed on the fourth postoperative day. At this time the patient developed edema of the right eyelids. On the seventh postoperative day, he developed photophobia, lacrimation of the left eye, and a bilateral, superficial, punctate keratitis which persisted in spite of local treatment with hot compresses and the administration of intravenous typhoid vaccine. On the 14th postoperative day, the patient developed a spontaneous subconjunctival hemorrhage in the right eye at the 1-o'clock position, just outside the limbus. The following day this lesion became edematous, and a similar lesion appeared in the left eye. Within 48 hours, both lesions ulcerated, and the patient developed spontaneous epistaxis. Smears and cultures were taken from both lesions for aerobic and anaerobic bacteria, acid-fast bacilli, and fungi. These were all repeatedly negative except for an occasional colony of diphtheroids. Direct scrapings were taken from both lesions and the nasal mucosa and stained for tubercle bacilli and ordinary bacteria. These were likewise negative.

The conjunctival and scleral necrosis continued to progress until a "porcelain white," completely avascular slough developed (figs. 1 and 2). The patient was treated locally with penicillin drops and systemically with 30,000 units of penicillin every three hours. There was very little change in the patient's condition, although 21 days after the onset of the ocular disease, an occasional vessel could be seen appearing in the area of the

Fig. 2 (Harbert and McPherson). Left eye. Similar lesion of left eye.

slough. One month after the onset, the patient was given streptomycin (2 gm. daily for 5 days), with no apparent effect on the slow healing process. After cessation of the streptomycin, the patient became febrile, spiking a temperature of 99° to 100°F. at irregular intervals. Repeated blood cultures taken during the febrile period were negative.

At this time the eyes first showed some definite evidence of improvement. Conjunctival epithelium began to cover the scleral sloughs which had become so deep that uveal pigment could be seen shining through. At the same time, from the marginal conjunctiva, vessels began to invade the sloughing sclera and adjacent cornea to form a superficial pannus (fig. 3). The patient complained of paresthesia of both hands and developed a persistent eosinophilia of 8 to 10 percent, albuminuria (1 plus to 3 plus), and microscopic hematuria. The sedimentation rate was

Fig. 3 (Harbert and McPherson). Right eye. Showing superficial pannus vessels and vascularization of central area of slough.

27. Blood Kahn and spinal-fluid examinations were negative. In view of these findings it was thought advisable to perform a muscle biopsy to exclude periarteritis nodosa. This was done in the seventh week of the ocular disease.

Fig. 4 (Harbert and McPherson). Right eye. Showing early stage of secondary scleral nodule.

PATHOLOGIC REPORT

The pathologic report of T. W. Bennett, Comdr. (MC), U.S.N.R. is as follows.

Sections from the gastrocnemius were studied (fig. 5). In areas in the muscle fibers, there was evidence of low-grade inflammatory change. In one area between the muscle fibers, there were cross sections of several small blood vessels. These vessels were identified as arterioles. In one, there was practical occlusion of the lumen of the vessel. The intima appeared to be missing, and there was an apparent thrombosis with beginning canalization. About this area, there was proliferation of connective tissue and a zone of round cells, polymorphonuclear leukocytes, plasma cells, and occasional eosinophiles. In another area there appeared to be complete thrombosis and organization resulting in fairly dense fibrous tissue. About this area there was evidence of chronic inflammation. Another vessel was seen which appeared to have proliferative changes in the intima and subintimal area. About this area there was a moderate amount of chronic inflammatory change characterized especially by the presence of plasma cells. It is believed

that these sections represent three stages: (1) Beginning proliferative changes in the intima, (2) complete thrombosis with occlusion of the vessel, and (3) complete thrombosis with beginning canalization of the thrombotic area. These findings are consistent with those occurring in periarteritis nodosa.

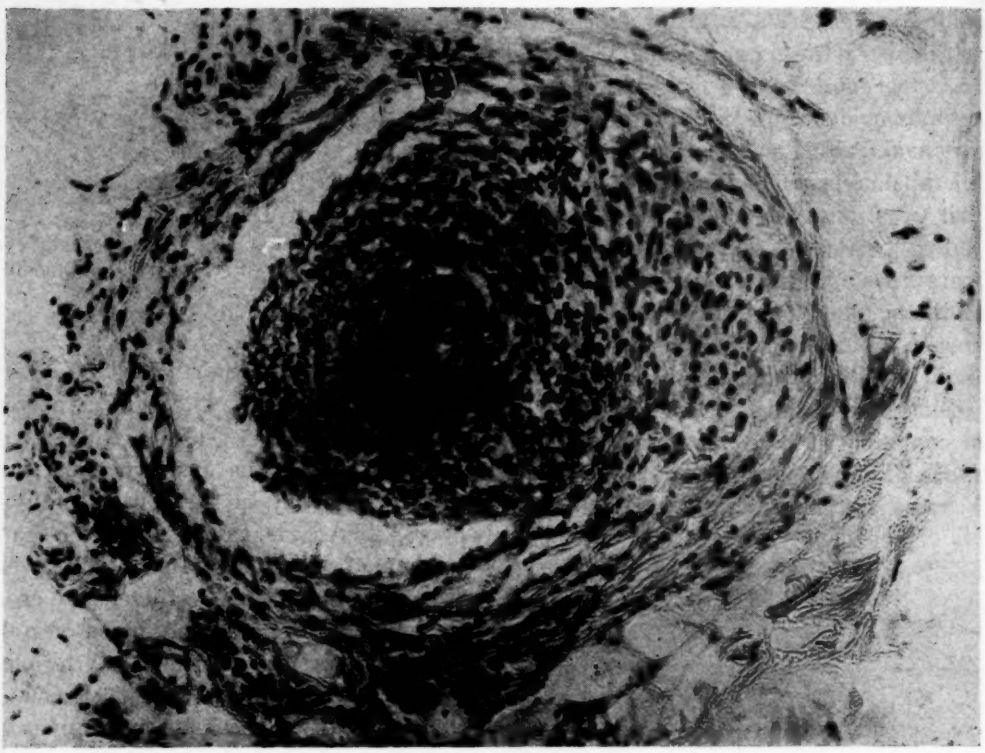

Fig. 5 (Harbert and McPherson). Typical periarteritis in muscle biopsy.

Subsequent course

In the eighth week of the ocular disease, the patient developed redness, pain, and swelling of the right ankle which was considered due to vascular occlusion followed by a similar lesion of the left wrist in the 10th week. The wrist lesion suppurated. The corneoscleral lesions relapsed, the necrosis extending into the cornea. Prior to this time, the ocular media were clear to repeated examinations with ophthalmoscope and slitlamp. The vitreous now became hazy, and a beam without cells appeared in the anterior chamber, 11 weeks after the onset of ocular symptoms. Shallow necrotic ulcers also developed on the buccal mucosa. Multiple vitamins, including riboflavin, failed to influence the course of the disease. Twelve weeks after the onset of ocular symptoms, the patient developed intradermal nodules on both feet and legs. Biopsy of one of these showed typical lesions of periarteritis nodosa (fig. 6). This diagnosis was confirmed by Dr. Arnold R. Rich of Johns Hopkins Hospital.

Fundus details were not now visible. The margins of the original scleroconjunctival slough were not healed, but the central portion showed a thin scar with uveal pigment showing through. The up-

per margin of the cornea developed superficial sloughs which coalesced to form an ulcer with an overhanging edge extending toward the central portion of the cornea in the manner of a Mooren's ulcer. superficial slough at the site of injection. Intradermal desensitization with 1:1,000 staph toxin was given for a month with no evidence of favorable response, and the patient was discharged from the hos-

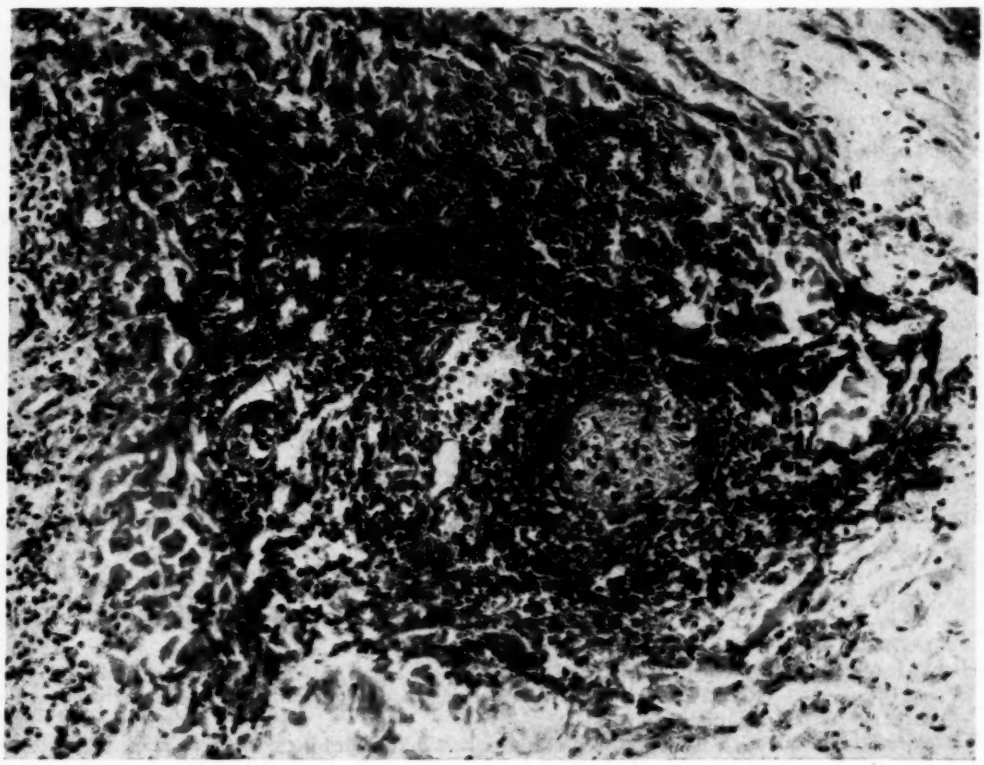

Fig. 6 (Harbert and McPherson). Typical periarteritis with thrombosis in skin biopsy.

There was scattered, superficial, corneal vascularization. Both corneas became edematous. The left eye developed several large keratic precipitates. Vision was: O.D., 1/200; O.S., 2/200.

Since the patient had responded to no other therapy, and in view of the previously reported positive blood culture for staphylococcus aureus, the patient was tested intradermally with staphylococcus toxin to determine his sensitivity. He was found to be mildly positive to 0.1 cc. of 1:1,000 dilution; and very markedly positive to 0.1 cc. of 1:100 dilution. With the 1:100 dilution, the patient developed a pital at his own request 15 weeks after the onset of the ocular disease.

Comment

A clinically similar type of ocular lesion has been described as anterior metastatic scleritis. According to Duke-Elder, this is usually due to a staphylococcal embolus (90 percent), but occasionally is due to pneumococci.[5] In a few cases, no organisms were found.

The fundamental pathologic change in periarteritis nodosa is inflammation of the medium and small arteries with fibrinoid hyaline necrosis and exudative processes.

As the necrotizing process subsides in one organ, it may involve another with remissions and relapses. Many etiologic explanations have been suggested but the most widely accepted one is that it is not a disease entity, but a hypersensitivity of the arterial walls. It is most often related to a bacterial allergy in chronic infections, but experimental evidence indicates that drugs, foreign proteins and serums, and even foods or pollens may be responsible. Since the widespread use of the sulfonamides, the number of cases reported has increased markedly. These drugs are presumed to act as haptens, combining with plasma proteins to form allergens.[2]

Summary

A case of scleral necrosis occurring in the course of periarteritis nodosa is reported and discussed. No treatment was of any avail despite the establishment of the diagnosis early in the course of the disease.

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NEUROBLASTOMA OF THE ADRENAL WITH ORBITAL METASTASES*

REPORT OF FIVE CASES WITH AUTOPSY FINDINGS

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The purpose of this paper is to add to the ophthalmic literature five proved cases of neuroblastoma of the adrenal with orbital metastases and to record the therapeutic failure of radioactive phosphorous as a method of controlling this fatal tumor of childhood.

HISTORICAL REPORT

Sympathetic neuroblastomas of the adrenals were recognized by Marchand[1] in 1891, who described them as being of neural origin. In 1910, Wright[2] confirmed Marchand's findings and established the tumors as clinical entities. Meanwhile two distinct clinical types had been described. In 1901, Pepper[3] reported an adrenal tumor which he called a congenital sarcoma that invaded the liver and regional lymph nodes, causing stillbirth or death in early infancy. In 1907, Hutchinson[4] described a similar adrenal tumor in children up to 15 years of age, but which metastasized early to the orbit, meninges, skull, and long bones. It is this, the Hutchinson type of neuroblastoma, which is of particular interest to the ophthalmologist.

CLINICAL PICTURE

The most common symptom which brings these patients to the ophthalmologist is a recurrent area of ecchymosis about one or both eyes, often thought to be of traumatic origin. This ecchymosis is soon accompanied by a firm, bony swelling somewhere about the orbit, which frequently results in proptosis and displacement of the globe, and which may reach the proportions of a malignant exophthalmos. Corneal ulceration and secondary infection can cause the loss of an eye.

Early in the disease, the primary tumor is rarely palpable. Enlargement and extension to adjacent lymph nodes frequently produce an upper abdominal tumor later. Metastases are commonly found in the skull and long bones, but their presence in liver, lung, lymph nodes, and so forth emphasizes the lack of a clean-cut differentiation between the "Pepper" and "Hutchinson" types. Subjective symptoms depend on the location of the metastases. If these occur in the skull, increased intracranial pressure is common, with headache, nausea, vomiting, choked discs, separation of suture lines of the skull bones, and hydrocephalus. If metastases appear in the vertebras and long bones, pain may occur in the back and extremities. One case[5] has been reported with multiple skin nodules present at birth. No sexual changes are ever noted such as are found in tumors of the adrenal cortex. General symptoms of weight loss, pallor, low temperature elevation, anemia, and a low leukocytosis are present.

A provisional diagnosis of neuroblastoma can be made from these symptoms. Confirmation must be obtained by biopsy and by X-ray studies. Biopsies can be taken from any area of metastasis or from the primary growth. X-ray studies of the involved bones show multiple, tiny foci of resorption, giving a finely granular osteoporosis with uneven density of the skull and pelvis. There may be local or

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extensive involvement of the long bones with elevation of the periosteum and metastatic areas of resorption in the ends of the diaphyses adjacent to the epiphyseal lines. Pyelograms show a normally functioning kidney often displaced downward. An important finding that is not usually mentioned is the presence of flecks of calcification in the primary tumor just above the pole of the left kidney.

Etiology and pathology

Embryologically the medulla of the adrenal gland is formed by the undifferentiated nerve cells of the primitive sympathetic nervous system. It is a failure on the part of these cells to mature that results in neuroblastoma of the adrenal. Although congenital, the time of onset of symptoms may be delayed as much as four years after birth, varying with the malignancy and the location of the metastases in the individual case. In the Hutchinson type, the tumor is in the left adrenal gland. Since the liver and lungs may both escape involvement, metastases are thought to spread by way of the fetal blood and lymph circulation. The only other alternative would be the spontaneous development of multiple primary tumors in various parts of the body.

Pathologically the tumor is made up of firm pink tissue, which cuts with a gritty feel, due to areas of calcification. The surface is mottled by hemorrhagic areas, as one would expect in a neoplasm of so vascular an organ as the adrenal. The thin-walled capillaries are the source of the orbital ecchymoses which so often are the first sign of the disease. The cells tend to be small and round, with dense hyperchromatic nuclei and but little cytoplasm. These are similar to the primitive migrating cell of the sympathetic nervous system. A few larger round cells with vesicular nuclei, and some pear-shaped cells resembling spongioblasts can be seen. In 30 to 50 percent of specimens, the small cells group in solid masses or hollow spheres, called "rosettes." All the cells give off delicate processes which unite to form a fibrillar syncytium (fig. 3).

Although the usual microscopic picture is conclusive, it may be very confusing. As stated by Wahl:[6] "Because the adrenal neuroblastomata are so malignant and composed of the sympathetic formative cell, any transition may be present between the primitive cell and chromaffin and ganglion cells." The various transitions may cause parts of the tumor to resemble glioma, scirrhous carcinoma, lymphosarcoma, or sarcoma. For years the tumor was thought to be a retroperitoneal sarcoma. Two of our five cases were misdiagnosed after a biopsy had been studied. It is, therefore, important that the entire clinical picture be considered, and that a microscopic diagnosis be obtained from competent pathologists.

Differential diagnosis

The differential diagnosis of neuroblastoma may be difficult due to the varying areas of metastatic involvement and to the infrequent finding of an abdominal tumor. The age group of the patients, in itself, limits the diagnostic possibilities. Careful blood studies will differentiate neuroblastoma from the blood dyscrasias which can produce ecchymosis and proptosis. However, aleukemic leukemia can produce a similar bony resorption in the skull without characteristic blood findings. Scurvy causes ecchymosis and X-ray studies of rickets will show subperiosteal proliferation. The dietary history and general physical findings should eliminate these diseases, however. Hemangiomas about the orbit will not produce this type of X-ray picture. Chloroma is a tumor which involves the flat bones, but its diagnosis is relatively easy because of a typical

microscopic and blood picture. Other neoplastic diseases are rare in children.

Course of the disease

The disease progresses steadily, irrespective of therapy. Pain is usually not severe and often is entirely absent. New metastatic foci appear, and the old areas continue to enlarge. Weakness and anemia become more prominent. As is common in neoplasms of children, the general health remains fairly good, with rapid failure in the few weeks before death. Patients rarely live more than one year after the first symptoms appear. Farber[7] reported that 10 out of 40 patients with neuroblastoma were alive 3 to 8 years after diagnosis had been made, but these patients did not have the Hutchinson type. He states that in every case with skull metastases, death resulted.

Treatment of the disease

X-ray therapy has been the only agent of any particular value in controlling neuroblastomas, and its effects have been temporary. To my knowledge, radioactive salts have not previously been used in this condition. Two cases of the five herein reported were treated with radioactive phosphorous in the form of sodium hypophosphate which had been prepared in the cyclotron of the University of California. Case 1 was given large doses of the radioactive salt by mouth, a total of 5.3 millicuries being given without effect. Case 2 was given a large single dose of radioactive phosphorous, intravenously. If tumor cells selectively pick up these salts, large concentrations can be demonstrated over the site of the tumor by the Geiger counter. In this patient, results were encouraging the first day. The count of radioactivity showed a definite concentration over the tumor site on the right orbit as compared to the control area on the left orbital rim. This initial difference rapidly diminished. By the next day, radioactivity was the same on one side as on the other. The initial difference was thought to be due to the increased vascularity of the tumor area. This type of treatment is of no value unless the salts are stored in the tumor cells, as occurs in thyroid cells when radioactive iodine is injected. The use of radioactive phosphorous in the treatment of neuroblastomas must, therefore, be recorded as a failure in these two cases.

X-ray treatments are of great help in controlling the size of the individual metastatic lesions. Their use may avoid a progressive exophthalmos which can cause the loss of an eye as occurred in two of the six reported cases. X-ray therapy also has an immeasurable psychologic value both for the parents and the patient, even though it may not prolong life. Deep X-ray therapy is usually applied in divided dosages over a period of two months. The tumor should be irradiated from two directions, each field receiving a total of 2,000r to 3,000r. Treatment other than X ray is entirely palliative. The anemia which appears in the later stages of the disease can be benefited by treatment with iron and liver, and by blood transfusions, though these only postpone the inevitable outcome.

Case reports

Of the six cases of neuroblastoma reported, five were of the Hutchinson type, and one, Case 6, proved at autopsy to be a neuroblastoma whose origin was high in the cervical sympathetic chain. In all six cases, ecchymosis about the orbit and proptosis were present, and they were the presenting complaints in two cases. Two of the six patients eventually lost an eye because of extensive exophthalmos. Ages in this group varied from 4½ months to 4 years. One patient lived 2½ years after the onset of symptoms, but the others died in 4 to 12 months.

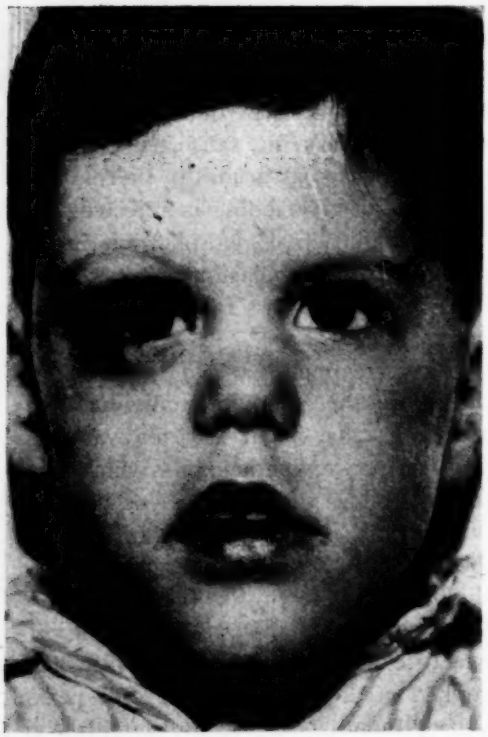

Fig. 1 (Shaffer). Case 2. Neuroblastoma of the left adrenal with metastasis to right orbit.

CASE 1

History. G. A. R., a white boy, aged 10 months, had as chief complaint a mass in right upper quadrant. His history showed that he was jaundiced for five days postpartum and had a rather large head. At the age of four months, he developed a slight difficulty in breathing, and at six months, a mass in the right upper abdominal quadrant was palpated. In the next three months, ecchymotic areas appeared about both eyes, and lumps developed on both temples and on the left shoulder.

Physical examination showed ecchymotic areas about the right eye and subconjunctival hemorrhages in both eyes. A large, firm abdominal tumor mass could be palpated in the right upper quadrant, and a small one was noted in the left supraclavicular fossa.

Laboratory findings. Blood tests reported: Red blood corpuscles 3.8 million; hemoglobin, 84 percent; white blood corpuscles, 8,000; normal distribution. Urine tests were negative.

X-ray studies showed moth-eaten areas in both frontal bones, in the intertrochanteric area of the left femur, and in both tibias. No calcification was seen in the abdominal mass. A biopsy of the supraclavicular mass revealed neuroblastoma.

Course of the disease. Doses of 700r of X ray were given to the frontal area. Metastases increased in size and in number. Proptosis developed. Hemoglobin dropped from 85 to 54 percent. Large doses of X ray seemed to have no effect on the tumor. A total of 5.3 millicuries of radioactive phosphorous was given by mouth without improvement. The patient died one year after onset of symptoms. At autopsy it was seen that the tumor was seeded throughout skull, long bones, a few ribs, and the abdominal and thoracic lymph nodes. In this case the liver was also heavily invaded, and there was scattered invasion of the pancreas. Microscopically, the cells were typical of neuroblastoma.

CASE 2

History. T. F., a three-year-old white boy, was seen because of recurrent subcutaneous ecchymosis of the right eye.

Physical examination revealed a low, rounded swelling of the right frontal bone extending from the lateral orbital rim halfway up the forehead. The eye was slightly proptosed, and pushed downward and inward. A faint ecchymosis of the right upper lid could be seen. No diplopia could be elicited. The fundi were normal.

Laboratory findings. A blood count showed red blood corpuscles, 3.69 million; hemoglobin, 75 percent; white blood corpuscles, 13,700 normal distribution. Urine tests were reported negative.

X-ray studies revealed a roughening and thickening of the right superior orbital rim, with small areas of rarefaction in the frontal bone. A bone survey was otherwise negative. Above the left kidney, which was normal by intravenous pyelography, was a 1½ by 1 cm. ringlike calcification. The lungs were slightly hazy.

The clinical diagnosis was neuroblastoma of the left adrenal.

Course of the disease. The left adrenal was removed surgically to prevent further metastases. No local metastases were noted. Grossly and microscopically the tumor was typical of a neuroblastoma.

Radioactive phosphorous was injected intravenously, but no selective retention of the salt by the tumor was shown. Deep X-ray therapy to the skull resulted in a definite shrinkage in the size of the tumor mass. Six months later, a similar mass in the left temporal fossa responded similarly to X ray. Terminally, a progressive anemia developed with low fever and weakness. The patient died suddenly one year after the onset of symptoms.

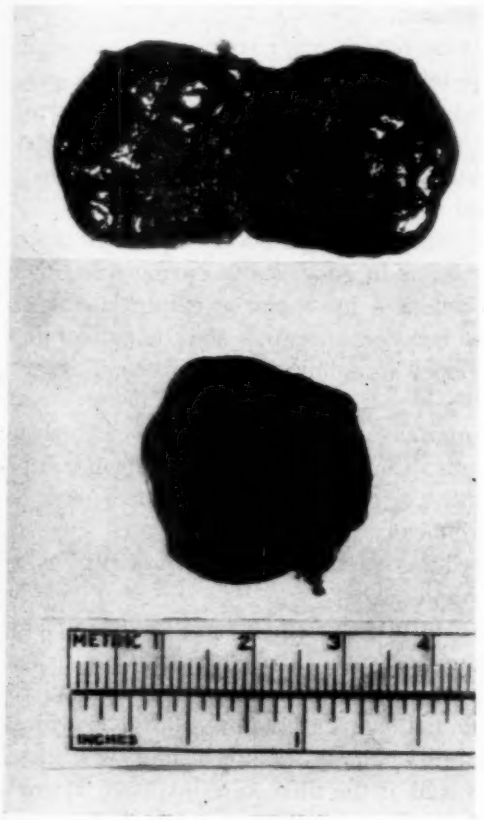

Fig. 2 (Shaffer). Case 2. Adrenal tumor after surgical removal.

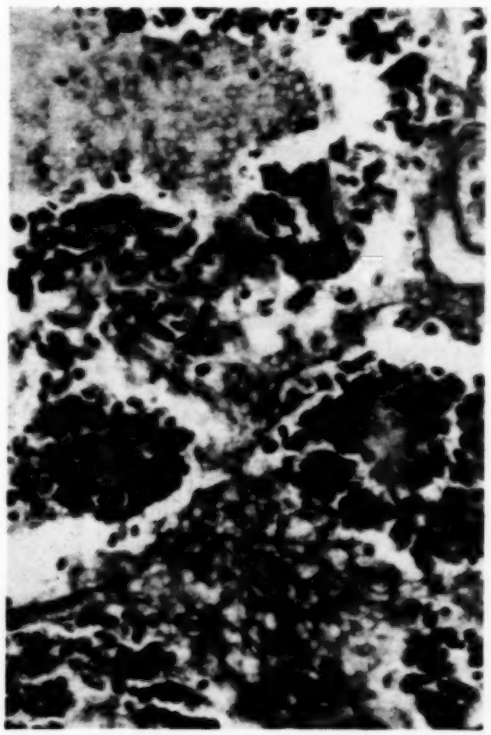

Fig. 3 (Shaffer). Photomicrograph of neuroblastoma showing rosettes.

CASE 3

History. P. B., a girl, aged 3½ years. After a normal infancy, the patient began to have an intermittent fever of 103°F. four months before entry. She complained of pains in the neck and legs.

Physical examination. A firm mass was felt in the left upper abdomen; otherwise the examination was negative.

Laboratory findings. Blood tests showed: red blood corpuscles, 3.2 million; hemoglobin, 60 percent; white blood corpuscles, 7,800; distribution, normal.

Urine, spinal fluid, tuberculin test, blood cultures, and various agglutination tests were all negative.

X-ray studies showed a rarefaction and some periostitis of both femora and humeri. A ringlike area of calcification, 3 by 4 cm. in size, was seen in the abdomen just lateral to the left lumbar spine between the 11th and 12th posterior ribs.

A bone-marrow biopsy reported: blasts, 1.6 percent; myelocytes, 0.4 percent; metamyelocytes, 1.4 percent; nonfilamented, 2.4 percent; filamented, 0.6 percent; eosinophils, 0.2 percent; lymphocytes (mostly young), 89 percent; and nucleated red blood corpuscles, 4 percent. A lymph node biopsy was negative. The tentative diagnosis was aleukemic lymphatic leukemia.

Course of the disease. The intermittent fever continued. Some swelling about the eyes and on the legs appeared. Veins on the skull became prominent and a cracked-pot resonance of the skull could be obtained. The optic discs were found to be choked, with an elevation of about 3 diopters. X-ray pictures showed extensive separation of the skull sutures, mottling of the skull bones, and extension of long-bone involvement. A blood count showed 3.17-million red blood corpuscles with 55-percent hemoglobin; 10,000 white blood corpuscles; and normal distribution. Neuroblastoma of the left adrenal was proved at autopsy.

CASE 4

History. G. L. J., a boy, aged 20 months, was seen because of an intermittent rash and fever for 15 months. An erythematous rash first appeared on the face, neck, and chest at the age of five months. It was associated with a fever of 100° to 101°F. every few weeks and with a slight anemia.

Physical examination. A large firm mass could be palpated in the abdomen in the left upper quadrant. Otherwise, the examination was negative.

Laboratory findings. Blood test reports: red blood corpuscles, 4.7 million; hemoglobin, 76 percent; white blood corpuscles 12,200; normal distribution. Urine tests were negative.

X-ray studies showed a partially calcified abdominal and retroperitoneal tumor which caused a bulge of the left psoas muscle and downward displacement of a normal left kidney.

Course of the disease. A large mass was removed from the abdomen. Lymph nodes along the vena cava were seen to be involved. The tumor cut with a gritty feel, and the cut surface was mottled yellow, red, and blue with small gritty particles of calcium scattered throughout. Pathologically the cells were typical of neuroblastoma.

One month after entry, rarefaction of the left frontal skull was seen by X ray, and deep X-ray irradiation was instituted. A total of 1600r was given front and back over the skull, lower mediastinum, and upper abdomen.

The patient was not seen for two years and was in good health during this time. Then, a 4 by 5 cm. swelling, lateral to the left eye, appeared, and the patient developed irritability, leg pains, and fever. The blood picture at this time was not remarkable. X-ray studies showed further rarefaction of the skull, left tibia, pelvis, and, perhaps, the vertebra and supraorbital plate. Weakness increased, and he died 2½ years after the onset of the first symptoms.

At autopsy, many white nodules were found in the pancreas, right adrenal, preaortic and mediastinal nodes. The left adrenal had been removed in the previous surgery. The testes, dura, and skull bones, as well as the tibia were involved. Microscopically the cells were typical of neuroblastoma.

CASE 5

History. C. D., a girl, aged nine months, had shown dark areas around her eyes for two months.

Physical examination. Firm, bony swellings of the skull were present—two in the right occipital region, 2 by 2 cm. in size; one above the right ear 2 by 2 cm. in size, pushing the ear downward; and a 2 by 5-cm. mass in the left temporal region. Marked ecchymosis was present about both orbits, and there was pronounced exophthalmos, more marked on the right. The spleen could be felt 6 cm. below the costal margin.

Laboratory findings. Blood: red blood corpuscles, 3.28 million; hemoglobin, 70 percent; white blood corpuscles, 17,350; normal distribution. Urine tests were negative.

X-ray studies showed irregular destruction of the skull bones. The facial bones were practically destroyed. An osteolytic process was present in the lower three fourths of the tibia. The clinical diagnosis was chloroma.

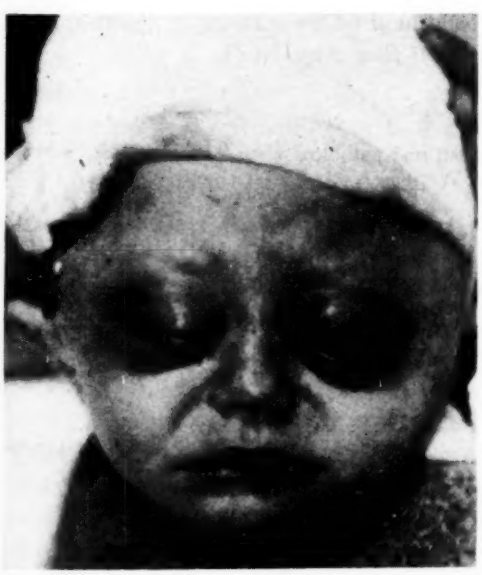

Fig. 4 (Shaffer). Case 5. Neuroblastoma of left adrenal with multiple metastases.

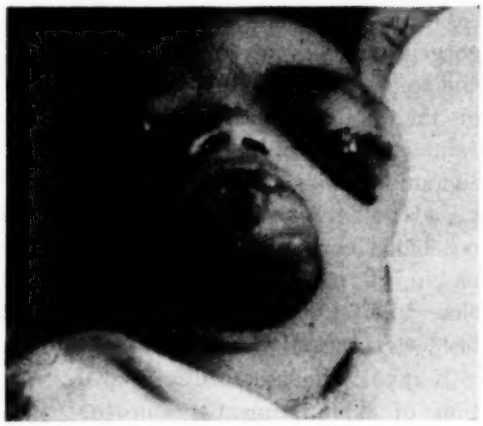

Fig. 5 (Shaffer). Case 6. Neuroblastoma of cervical sympathetic chain.

A biopsy from one of the skull lesions was obtained, and a pathologic diagnosis of myeloma was made.

Course of the disease was steadily downhill. Both femurs and tibias showed extensive bony destruction, and the skull lesions progressed. Exophthalmos became more marked. A corneal ulcer, which appeared on the right eye, subsequently perforated. The child died two months after entry and four months from the time of onset of symptoms.

An autopsy revealed a typical neuroblastoma of the left adrenal with metastases to the regional retroperitoneal, iliac, and inguinal lymph nodes. Practically every bone in the body was riddled with tumor. A single nodule was present in the liver.

CASE 6

History. S. J., a 4½-months-old girl was seen because of the prominence of both eyes. At the age of 2½ months, she had developed a nasal discharge and occasional vomiting. At 3½ months, both eyes had become prominent, and fixed in the sockets.

Physical examination. Bilateral proptosis was present, more marked on the right, and there was no light reaction in

either eye. The fundus veins were engorged, the discs were elevated 2 diopters, and some exudate could be seen. The roof of the mouth appeared thickened. The fontanels were open and very tense. No abdominal mass was palpable.

Laboratory findings. Blood count was: red blood corpuscles, 5.4 million; hemoglobin, 70 percent; white blood corpuscles, 16,800; normal distribution. Urine tests were negative.

X-ray studies showed a total destruction of bone lying between the nasopharynx and the sphenoid, extending into the posterior ethmoid sinuses and the floor of the middle fossa on both the right and left sides. No signs of abdominal tumor were present. The provisional diagnosis was chordoma. A biopsy diagnosis was neuroblastoma. The revised diagnosis was neuroblastoma of the adrenal with metastases.

Course of the disease. The symptoms increased rapidly, and on terminal hospital entry, at the age of one year, the left eye was pushed completely out of the orbit onto the cheek, and was atrophic and desiccated. The right eye was pushed down and out. A baseball-sized mass filled and protruded from the mouth. The child died 10 months after onset of symptoms.

At autopsy, no involvement of the adrenal was demonstrated. The lungs were studded with metastases. The whole central skull was involved in the tumor mass. Histologically, the tumor was demonstrated to be a neuroblastoma. Its origin was in the region of the superior cervical ganglion. The final diagnosis was neuroblastoma of the superior cervical sympathetic ganglion.

Summary

Neuroblastomas of the adrenal gland of the Hutchinson type are discussed. Five case reports with autopsy findings are given. One case, with an identical clinical picture, had its point of origin high in the cervical sympathetic chain. Radiologic evidence of calcifications above the left kidney at the site of the primary tumor is an extremely important clinical aid in diagnosis. This finding has been insufficiently emphasized in the past. The use of radioactive phosphorous has been unsuccessful, up to this time, in the treatment of these cases.

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PAPILLEDEMA AND PAPILLITIS*

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The clinical and pathologic differences between papilledema and papillitis were clearly defined by Paton and Holmes[1] in 1911, but ophthalmologists are still debating the issue. In 1942, Bedell[2] reported six cases of papilledema without increased intracranial pressure. Lillie[3] and Verhoeff[4] raised the question as to whether Bedell's cases were really papilledema or optic neuritis, and the subject was fully discussed. The point is that as recently as 1942, there was still dissension as to the differential diagnosis between papilledema and papillitis.

In using the term papillitis. I refer to optic neuritis with involvement of the intraocular portion of the optic nerve so that exudates and hemorrhages are seen on and around the disc. This is in contrast to retrobulbar neuritis, which is optic neuritis of a more posterior portion of the nerve, and which, in the early stage, produces no ophthalmoscopic visible evidence. When optic neuritis is mentioned in this article, it means optic neuritis with papillitis.

When one is confronted with a swollen disc, hemorrhages, exudates, and venous engorgement, one must differentiate between papilledema and papillitis. Of course, if the history, the clinical and neurologic pictures, X-ray air studies, lumbar punctures, and electroencephalograms point to a definite intracranial mass, there is usually little or no problem—one is most likely dealing with papilledema. Such cases are not apt to cause confusion. It is in those early cases in which the studies are inconclusive that the ophthalmologist is faced with the problem of differentiating between papilledema and papillitis. An early diagnosis of papilledema in such cases may help to bring early surgical intervention and, thereby, save life.

To help in this differential diagnosis, we must utilize the funduscopic picture, the study of visual acuity, and studies of the central and peripheral fields.

The differential diagnosis of papilledema and optic neuritis was well described by Aiken and Cordes.[5] I wish to mention a few words about the funduscopic picture and to emphasize especially the importance of the visual-acuity and the field studies.

FUNDUSCOPIC PICTURE

Many of our recent textbooks contain valuable differential funduscopic pictures of papilledema and papillitis. However, I believe that many ophthalmologists will concede that the ophthalmoscope alone will not always give a clean-cut differential diagnosis. I have often found the application of these differentiating points rather difficult in the many cases of papilledema and optic neuritis seen at Montefiore Hospital. Not all cases of papilledema have the typical mushroom appearance of the swollen disc projecting into the vitreous. Many of the cases show a diffuse blurring of the disc margins caused by exudates extending into the peripapillary retinal layers, with hemorrhages or exudates, arterial narrowing, and venous engorgement. This produces a picture so much like optic neuritis that a differential diagnosis becomes almost impossible. Unilaterality or bilaterality are sometimes used as criteria but, although papilledema is more often bilateral and optic neuritis unilateral, one does see uni-

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lateral papilledema in the early stage and optic neuritis is occasionally seen bilaterally.

Visual acuity

The history of loss of vision may often be helpful in deciding whether the case is one of papilledema or optic neuritis. It has been stated that a history of sudden loss of visual acuity speaks for optic neuritis while gradual or little to no loss of visual acuity points to papilledema. Let us scrutinize this statement for its pitfalls. Often the word "sudden" must be evaluated carefully. For example, a patient may say that he has suddenly lost vision in an eye when he really means that he has suddenly become aware of the fact that his vision was poor in that eye. Actually, he may have had papilledema for quite a long time, with some spread of edema to the macular area and a gradual reduction in central vision.

On the other hand, the patient may say that he merely has a slight blurring of vision, that he can actually read 20/20. Such a case, at the bedside, would make one think of papilledema. Still, this picture may be that of a case of optic neuritis with a paracentral scotoma and retention of 20/20 vision. The paracentral defect may cause only a slight diminution in central visual acuity (case 1). In fact, one may see a nerve-fiber bundle defect with complete sparing of central vision (case 2). Of course, cases of these two types are not common. Case 2, demonstrating a nerve-fiber-bundle defect in optic neuritis, is probably rare. Since such cases do sometimes occur, however, the possibility of their presence must be borne in mind.

Sudden loss of vision, although classically denoting optic neuritis, can actually be the patient's description of sudden awareness of a gradual loss of vision in papilledema; and good central visual acuity can be retained in optic neuritis with paracentral defects. From this discussion it is apparent that a study of the central fields on the tangent screen assumes paramount importance in making a differential diagnosis between papilledema and optic neuritis. This emphasis on the study of visual fields seems timely in view of Cordes's recent plea for a more extensive understanding of perimetry.[6]

Visual-field studies

The classical field picture of papilledema is that of an enlarged blind spot. In optic neuritis, however, there is a central or paracentral defect, together with some enlargement of the blind spot and peripheral depression. Here again we encounter pitfalls, both in the examination and its evaluation.

One must remember that in early papilledema, the enlarged blind spot is surrounded by a zone of relative field defect, corresponding to the "sloping edge" of Traquair. This pericecal zone of relative defect probably corresponds to that portion of the peripapillary retina whose percipient elements, while not completely pushed aside, have been sufficiently encroached upon by the edema and pressure as to diminish their sensitivity.

When this area of relative field defect is wide enough, as in marked or rapidly spreading papilledema, it will involve, temporally, the macular area, and produce a relative central scotoma. However, to differentiate this from the central or cecocentral defect of optic neuritis, we find that, in papilledema, the relative scotomatous encroachment on the central area is just the temporal portion of a general pericecal involvement, the relative scotoma reaching rather uniformly around the entire enlarged blind spot.

In optic neuritis, on the other hand, the central or paracentral defect, if connected with the cecal area, is more apt to

be connected by a comparatively narrow bridge of field defect, so that the overall picture will be that of an area shaped like a dumb bell. It may, perhaps, simulate the cecocentral defect of tobacco amblyopia. It is likely that this cecocentral communication will be lost in time. It may be that, at the start, the central or paracentral defect will show no connection with the enlarged blind spot.

In those cases of macular or paramacular involvement, in which it is difficult to tell whether the central defect is due to the spread of edema from papilledema or to an independent paracentral defect fusing with an enlarged blind spot, it has been found that when the density of the defect keeps on diminishing from the cecal area to the point of fixation papilledema is present; while, in papillitis, as the cecal area is approached, some areas of increased density again appear. If the findings are not sufficiently clear or convincing, the central fields must be followed daily. In cases of papillitis, the central defects are apt to become separated from the cecal defect within several days, the enlarged blind spot is likely to diminish in size (fig. 2 A, B, and C), and the central defect to persist as a discrete scotoma (fig. 2 B and C). In papilledema, however, the enlarged blind spot persists and even increases in size, the central defect continuing to be part of the general pericecal involvement. In other words, after a week or two, papilledema will still show a preponderance of defective field around the blind spot; while in papillitis, the greater amount of defect will persist around the fixation area.

As a rule, the connecting cecocentral portion of the scotoma of papillitis is apt to be less dense than the central one, but the relative densities of these areas may be difficult to evaluate. A careful search of the paracentral area should be made. If small enough visual angles are used, one may find small, dense areas within larger, less dense areas. This will help to establish the diagnosis of optic neuritis. In cases of this sort, quantitative perimetry assumes great importance. For example, if the enlarged blind spot is mapped out with 10/2,000 white and no central defect is found, an examination with 2/2,000 white may bring out a central or paracentral defect, with or without a cecocentral connection. One must bear in mind that early cases only are being discussed. If a case of papilledema is several months old, some central defects may have developed. Also, one must bear in mind that there are central scotomatous defects in neoplastic lesions around the chiasma, such as in the series of cases of suprasellar meningioma recently described by Schlezinger, Alpers, and Weiss.[7] However, in the early stage, neoplastic lesions are not likely to show papilledema, and the clinical picture is more apt to be confused with that of retrobulbar neuritis rather than with that of papillitis.

According to Traquair,[8] one should be able to differentiate macular involvement in spreading papilledema from the central involvement of optic neuritis by the different colors of test objects. Retinal involvement from papilledema should give a defect for yellow and blue; while direct involvement of the optic nerve should cause more defect for red and green. I have been unsuccessful in duplicating all these findings in a number of cases, but have found white test objects of small sizes very useful for quantitative evaluation. Red test objects are, however, useful in determining the relative densities of nerve involvement in scotomatous areas. The patient will often give a descriptive response of the hazy red color in a less dense area and the change to a neutral gray in a denser area. A good subject can give very descriptive and reliable

responses which enable one to evaluate the relative densities of different parts of the scotoma.

In searching for scotomatous areas around the point of fixation, one must be careful about labelling an area as nonscotomatous. The two-meter screen will be found very useful for this purpose, since all scotomatous areas are so much larger in their projection on this plane and, therefore, there is less chance of overlooking a defective area. This magnification of defective area is also an advantage in examining a patient who will hesitate to speak up when the test object disappears for only a brief instant as on the smaller screens or campimeters. One should move the test object along the vertical and horizontal meridians—toward the center—rather slowly, so as to give the patient a chance to note a small area in which it disappears. Then, the intermediate meridians (that is, the 45 degree, 135 degree, and so forth) are examined in a similar fashion. I prefer to have the patient keep on saying, "I see it, I see it." In this way, there is less possibility of missing a small patch that may not seem important enough to the patient to report. If the patient just hesitates at one area, that is a lead to explore the area more carefully with weaker stimuli.

When this is over and no scotoma has been found, I like to use "rapid comparisons"—that is, placing the test object in one pericecal quadrant and changing it quickly to another; or, placing it near the point of fixation and then quickly changing it to a point 10 or 15 degrees away in the same meridian. The patient is asked if there is any marked difference in the appearance of the target in these various areas. This method will help to pick up patches of relative scotoma in which the density changes so gradually that the patient will not notice the change with steady, slow motion. A sudden contrast between this area of relative scotoma and a normal area will make the change more apparent to the patient.

Pericentral quadrants should show up the test target equally well at points equidistant from the fixation point. If the patient says that the target is definitely brighter or clearer peripherally than at a more central point in the same meridian, further investigation should be made, for this information points to some central or paracentral defect.

In describing a scotomatous area as absolute, it is best to use at least a 10-mm., or even 20-mm., white test object on a two-meter screen. Even then, one must remember that this area is absolute for that particular visual angle and may still be only relative for a larger visual angle or with greater illumination.

The use of small white test objects for the study of the blind spot in these cases is often difficult and has its pitfalls. Test objects even as large as 2.0 mm., although normally subtending a visual angle large enough to reach even beyond the 30-degree arc on the two-meter screen, may not reach this far in cases of papilledema or optic neuritis because of the peripheral constriction that often accompanies these conditions. In such cases, the blind spot may fall outside the peripheral field for that visual angle. This same principle holds true for the paracentral area where the isopters for small angles are close to the point of fixation. In other words, in examining the blind spot or the paracentral area, one must be certain that the area investigated falls within the peripheral limits of the field subtended by the particular visual angle used. A simple method for ascertaining this information is to make sure that the patient can see the test object on the screen somewhere temporally to the blind spot. If the field for 2/2,000

white should extend to the 15-degree meridian, thus making this visual angle unsuitable for a study of the blind spot, it is still suitable for evaluation of the pericentral area.

The 1-mm. white test object at two meters must be used with great caution even when exploring the field within the 5-degree arc. With such small test objects, the carrier becomes very important, and one must be careful to ascertain if the patient is really aware of the white test object rather than of the carrier. I have found the spherical test objects most useful in all my work.

A word or two about wearing of corrective lenses during central field examinations on the two-meter screen seems in order. Young patients with small hyperopic corrections, (+1D. or less) are better tested without their glasses. If the patient's age is more than 35 or 40 years, it is preferable for them to wear even small plus corrections. All myopic patients should wear their corrections. Care should be taken when the patient is wearing bifocals with high reading segments. In such cases, it is best to use a trial frame and trial-case lens with the distance correction only.

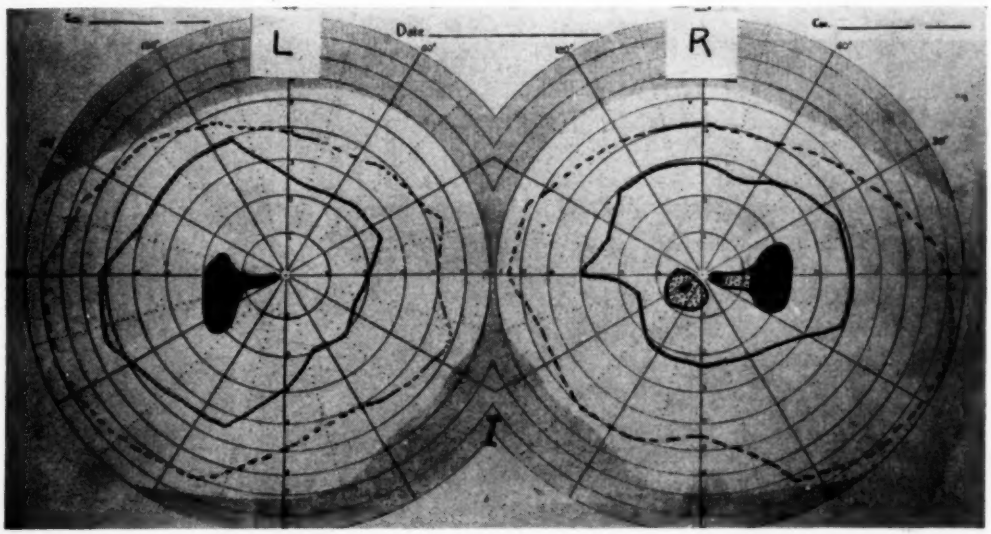

Fig. 1 (Chamlin). Case 1. Papillitis with paracentral-field defects. Peripheral-field studies on March 24, 1946, for 5/330 white and 1/330 white. Central-field studies for 10/2,000 white show enlarged blind spots with extension toward, but not quite reaching, point of fixation, and an independent, relative paracentral scotoma in the right eye, with a dense nucleus. White line within the enlarged blind spot denotes the normal blind spot.

Case reports

Case 1. S. W., a white man, aged 54 years, was admitted to Montefiore Hospital March 21, 1946. A brain tumor was suspected. The patient stated that the vision in his right eye had been a little blurred for the past few days.

Both fundi showed swollen discs with hemorrhages, exudates, and engorged veins. Vision in the right eye was 15/40; in the left eye, 15/20. Field studies done on March 24th revealed a generalized peripheral depression for 5/330 white and an even greater depression with local indentation for 1/330 white. These conditions were more marked in the right eye in which central vision was most affected. Central-field studies were made with

10/2,000 white. Both blind spots were enlarged to almost five times their normal size, with extension of the scotomatous areas toward the point of fixation. There was an independent, relative paracentral scotoma with a dense nucleus in the right eye. In 10 days, the blind spots diminished to less than twice their normal size. In one month, the blind spots were almost normal, but the paracentral defects persisted and were still present in August, 1946.

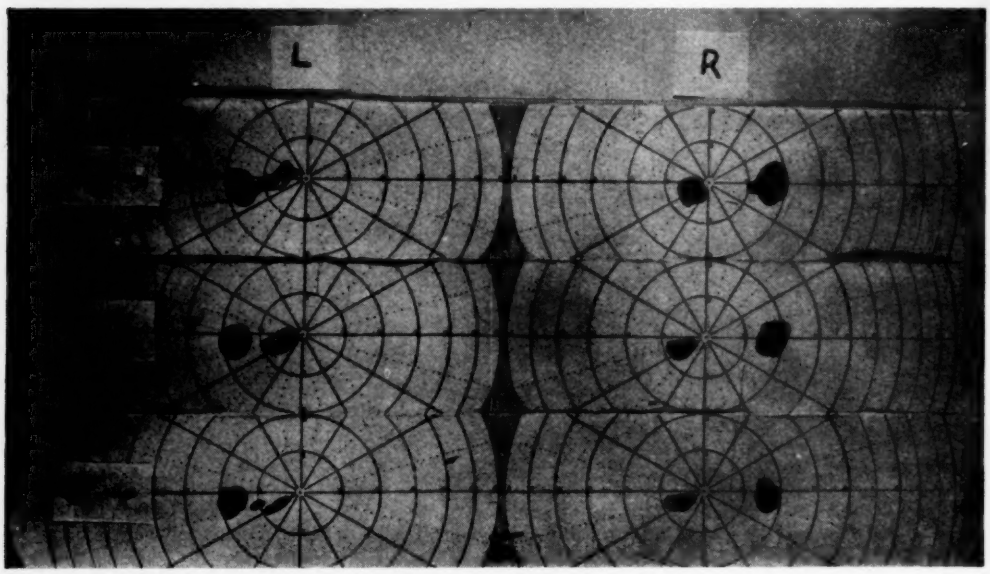

Fig. 2 (Chamlin). Follow-up of central-field studies on Case 1. Done with 10/2,000 white. A, April 3, 1946; B, April 15, 1946; C, April 24, 1946. Successive studies show diminution in the size of the blind spots, with persistence of paracentral defects.

This case illustrates papillitis with little loss of central vision in one eye and practically no loss in the other. Until the central studies were made, the funduscopic picture and retention of fair central vision led one to believe that the condition was one of papilledema.

Case 2. G. T., a white man, aged 52 years, was seen on May 11, 1946, with a history of a "film" over his right eye for the past week.

Visual acuity was 15/13 in each eye and remained so throughout a month of observation. The left fundus was normal. The right fundus showed a swollen disc, with hemorrhages, exudates, and engorged veins. Field studies revealed normal findings in the left eye. The right eye showed a localized depression in the lower peripheral field for 4/250 white. The central field for 2.5/1,000 white showed an enlarged blind spot with a relative scotoma extending down from it and spreading and arching around the point of fixation as a Bjerrum scotoma or nerve-fiber-bundle defect.

One month after the original field studies were made, the scotoma showed signs of clearing, but vision remained 15/13.

This case illustrates papillitis with a nerve-fiber-bundle defect and preservation of normal central vision as measured on the Snellen chart. Central field studies gave the necessary proof that this was a case of papillitis and not papilledema.

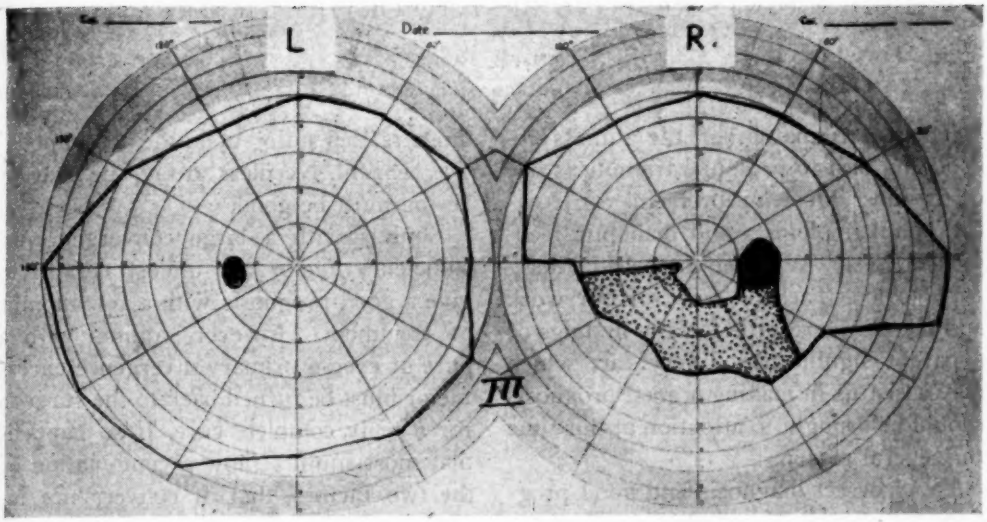

Fig. 3 (Chamlin). Case 2. Papillitis with nerve-fiber-bundle defect. Peripheral field for 4/250 white shows local depression below, fusing with the relative nerve-fiber-bundle defect coming down from the enlarged blind spot. The central field was mapped out with 2.5/1,000 white.

Summary

The early stages of papilledema and papillitis (optic neuritis) may produce a confusing picture. This is illustrated by the presentation of typical cases. The history, clinical examination, ophthalmoscopic appearance, and visual acuity may not be enough for differentiation. The study of the central fields of vision is of paramount importance in such cases. However, central field studies present many problems, a few of which are evaluated in this article.

1840 Grand Concourse (57).

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WHICH SQUINTS RESPOND BEST TO ORTHOPTIC TREATMENT*

EDITH ROTH
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The determination of the squints responding best to orthoptic training is one of the most important problems confronting ophthalmologists and orthoptic technicians today. We feel compelled, therefore, to look back on some of our work and search the records for any findings of apparent significance. Every fact which may assist us in making a good prognosis should be brought to attention at this time for several reasons:

1. A correct diagnosis and good prognosis will determine whether the squint is amenable to active orthoptic treatment.

2. Accurate diagnosis makes it easier for the ophthalmologist to place the patient in the proper category and thus put the proper emphasis on the type of treatment to be carried out by the technician.

3. A correct prognosis will make it possible to judge the length of time necessary for treatment, which is an item to be considered when certified orthoptic technicians are so scarce and the demands on their time so great.

4. When the patient can be placed in the proper classification, after a correct diagnosis, the ophthalmologist is better able to determine if and when surgery is necessary. It also aids him in the choice of surgical procedure.

First of all then, let us consider some of the types of squint. It is apparently agreed upon by ophthalmologists and technicians alike that purely accommodative squints offer the best prognosis. The squints which have a large accommodative factor are responsive to orthoptic treatment and refractive correction if the angle of deviation is not over 30 to 50 diopters, depending upon the accommodative element. Needless to say, the state of fusion must be good.

Squints with a large convergence-insufficiency factor are almost certain to give a good prognosis with a few months of treatment. However, squints with a pure or even a primary divergence-excess factor must be turned back to the surgeon for a truly complete cure. It so happens that most squints show a combination of the two factors, that of convergence insufficiency being the most common.

We have found that the few convergent squints with a larger angle of deviation for distance than for near are often more difficult to train. However, out of seven such cases in the past three years, two have been discharged as cured. We do not believe that any nonaccommodative convergent squints over 25 diopters are very amenable to cure by orthoptic training alone. Such a course of treatment is only recommended by the doctor when the patient is strongly opposed to surgery and does not consider the time element of treatment important.

Paralytic squints seldom fall into the category of purely orthoptic cases. Some cases of recent paralysis are referred on occasion, but, as a rule, the doctors do not consider even a case of paresis to be receptive to treatment alone. It is certainly true that most cases with a paresis of a vertical muscle must eventually be turned back to the surgeon, as nothing is more difficult for a patient to overcome than the uneven images of a large or highly variable hypertropia. If the vertical deviation is within 6 or 8 diopters, the incorporation of prisms in the glasses is often adequate until some compensation has been acquired in everyday seeing.

* Read at the meeting of the American Association of Orthoptic Technicians, Chicago, October 14, 1946.

In regard to amblyopic squints, only those patients with 20/50 vision, or better, in the poor eye are considered for active treatment. There does not appear to be any contraindication to a good result when visual acuity has been improved or central fixation has been restored. Preferably, not more than one or two lines difference in visual acuity should be found. The age of the patient is, however, important in considering the improvement of vision or the establishment of central fixation by occlusion or flashing. When the patient has reached teen age, it is difficult to carry through a strenuous procedure such as complete occlusion and monocular homework.

The prognosis of the anisometropic squints is rather difficult to predict. If the anisometropia is not more than 3 diopters and an alternate fixation is established in a short period of time by active treatment and occlusion, it appears to us that there is a possibility of cure. The attempt, therefore, may be worth while. Usually occlusion and treatment must be quite prolonged, even after alternate fixation has been obtained. Our experience with this type of squint has not been adequate to enable us to make any definite statements or positive conclusions. Since it has been noted that a number of cases of anisometropia with suppression or even amblyopia have shown no deviation at any time, it might be that surgery would prove most beneficial.

Most patients with a dissociated vertical divergence appear to have a general nervous instability that in itself is a definite handicap. These cases are said to be neurologic in origin, which makes us feel that the improvement of the patient's general physical condition will, perhaps, be more beneficial than a strenuous orthoptic work-up or possible surgical intervention.

It will probably be inferred from this discussion of types of squint that there is already some selection of cases at the Milwaukee Ophthalmic Institute. This is true in that a trial series of treatments, consisting of about eight visits, usually weeds out those cases considered uncooperative, not amenable orthoptically, or perhaps not ready for active treatment at the time. Nevertheless, we are only too cognizant of the fact that a greater and better selection of cases is necessary; especially is this so when the element of the time involved in some treatments must be considered. We are only too aware of the fact that we are still groping for added information on many problems.

In approximately three years of work, 255 unselected cases have been studied. Only 146 of these have had any active treatment of any kind. Of this number, 16 have now been discharged as cured, and 53 as definitely improved. Seven patients were discharged by us when several series of treatments failed to give the desired effect, and a score or so of patients have dropped out for various reasons of their own. The remaining number are still on treatment, although some have been given short vacations by the doctor. Frequently, a leave of absence will help to determine a patient's ability to hold what he has gained, and many times it aids one in making a prognosis. Eleven of the 44 cured or improved cases had surgery, five preorthoptically. The length of treatment varied from 2½ months to as long as 2½ years in a few cases. The age of the patients ranged from 3 to 45 years. During the last three years, the lack of personnel has forced the doctors to suggest that we devote the greater part of our time to children, in the belief that by doing this we could accomplish the greatest amount of good. Most of the children have been 3 to 8 years of age.

Our statistics on the findings and results in the treatment of a few types of

squint may be interesting, but you will readily concede that we have gained little of definite value in making a prognosis. We have all ascribed too many failures to certain abnormal physical conditions and too many successes to normal physical reactions. We may also attribute too much importance to the classifications of squint cases and to the statistical findings of such groups. There are certain handicaps to a successful result, we must admit, and these have been stated by too many ophthalmologists and technicians to bear repetition. When we try to sift out certain facts of apparent relevance, however, we realize that there are not sufficient data of statistical importance. Our leads do not *prove* anything; they do not even show much definite correlation. We can only reiterate the claims of others when we state that cases of rather late onset and short duration give the greatest hope of cure without resorting to surgery. As previously stated, our cases of accommodative squints are usually treated without any orthoptic exercises; squints with a large factor of convergence insufficiency can almost certainly be cured with some supervised work and home training; those with a major divergence-excess element require surgery in most instances—that is just about the extent of our findings.

In the final analysis, it is apparently not so much the type of squint which is significant, as it is the type of squinter. One of the most important factors to be considered in the individual case is the fusion status of the patient at the beginning of treatment. Those patients with muscle pareses, mixed correspondence, marked anisometropia, pure divergence excess, or dissociated vertical divergence are all handicapped, but they certainly are not hopeless cases. When only a glimmering of diplopia or true correspondence, a constant alternate suppression, or a persistent, firmly fixed, abnormal correspondence are present, there is reason enough to question the advisability of active treatment. Certainly a trial period of 2 or 3 months with no result in the elicitation of simultaneous macular perception or fusion is sufficient to discourage the most optimistic technician.

On the other hand, patients with quick response to fusion and even a feeble attempt at voluntary control are reasons for encouragement, as they are rare indeed in our Clinic. It has been our experience that a good or poor fusion faculty can only be determined by a short trial period, since there are no positive points in the history of the case to denote this possibility. When onset of the squint is at 3 to 6 years of age with some intermittent appreciation of single binocular vision, we are optimistic. However, a history of squint from birth does not necessarily indicate a poor prognosis. This is especially true if, at some time, the squint was an intermittent one, or if the patient is young (yet coöperative), because the duration of squint is then short.

The exceptions in the cases of squints with poor fusion dating from birth, are too many to enable us to make any positive statements or predictions. There are also many cases with histories of late onset and short duration which prove bitterly disappointing. We do not know how much we can depend upon any history, since so many prove unreliable. Few parents know what caused the squint, whether it is constant or occasional, or whether the onset was sudden or gradual. The squint is usually noted gradually, and, when we make the provisional diagnosis of constant manifest strabismus, most parents tell us the squint is only an occasional one, although it is sufficiently great to be obvious even to the lay person.

In spite of the fact that much is said and written about the poor prognosis of cases with abnormal retinal correspond-

ence, we do not find that most cases with a firmly established anomalous correspondence are much more difficult to treat than those with a persistent marked alternate suppression. Most of our cases show a marked suppression at the start making it necessary for us to treat them for a month sometimes, before coming to a definite decision concerning the prognosis.

Obviously we never diagnose the correspondence until some kind of actual binocular vision has been established; many cases of rapid alternate suppression simulate an abnormal sensorial correspondence, and the patient's answers, even in regard to the crossing of images, are unreliable. The cases of constant monocular esotropia with a rigid and moderate deviation are most likely to show a firmly fixed abnormal correspondence. Most of these cases, as well as most cases of marked alternate suppression, do occur in squints dating from infancy; that is, before three years of age. In fact, 71 out of 92 firmly fixed abnormal correspondence cases, which were studied, were apparently squints since infancy. It might be well to mention here that most of the cases dating from infancy also have a history of an inherited tendency. Out of the 255 cases studied, 109 cases had an hereditary deficiency. Out of the 109 cases giving this history, 86 cases dated from infancy. If the truth were known, inherited fusion deficiency would be a factor in the etiology of many more cases.

Second in importance only to fusion as a prerequisite in successful squint training is the attitude of the patient—the personal desire for cure. At times we feel this to be the most important consideration in the case, which challenges us all the more. Our experience has taught us that seldom does poor fusion sense, or centers, prove too much of a handicap for the patient who is eagerly intent on improvement—not forgetting, for our part, that at times an apparently insurmountable handicap may discourage the most eager patient. However, we fully realize that, as in any teaching process, the proper stimulus will usually elicit both attention and interest. Our constant questions must be so worded as not to divulge what we may expect or wish as an answer; yet they must help the patient to scan the targets for details that will suggest enough information to elicit further information. In this way the imagination of the patient is stimulated. By constant questioning only are we able to assure sustained attention.

When we survey orthoptics in all its aspects, we must acknowledge that our success or failure depends upon the patient as an individual—as a person to be taught rather than treated. Certainly the patient who is physically and emotionally ready for teaching has the best chance for success. We, as technicians or teachers, must assess the needs of the individual. We must judge the advisability of actively stimulating the patient with a phlegmatic divergent squint by routing his success. We must consider the importance of passively stimulating by subtle suggestions of success a patient with a hyperkinetic convergent squint. It is this personal equation which truly spells success or failure.

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Discussion

Dr. Frank D. Costenbader (Washington, D.C.): It is a pleasure to discuss Miss Roth's paper. Much has been written and said on the subject of "Orthoptics" by those who, unfortunately, are not well enough qualified to be help-

ful to us. However, if *we* can correctly state that certain types of squint are helped by orthoptic procedure, and other types are not, we are being helpful. Miss Roth has offered certain thoughts, and, in the main, I agree with them.

In my experience, three groups of cases respond well to orthoptic treatment. The first, convergence insufficiency, while not a squint, is a dysfunction of ocular motility, and rightly should be considered here. Convergence insufficiency is common and makes up the bulk of work in many orthoptic clinics. In my own practice, limited to children, the number is smaller, but these respond quite well to the binocular stimulation of accommodation, which is the chief method of stimulating convergence. We use so-called pencil exercises with many variations, prism exercises, the stereoscope with "base-out" slides, the metronoscope, and the major amblyoscope.

The second group of squints to respond well are the accommodative convergent ones, and, of these, the "typical" respond better than the "atypical." By "typical" I mean those whose esotropia varies directly with the diopters of accommodation being exercised. By "atypical" I mean those squints having a small refractive error, but an excessive esotropia when even moderately accommodating. The dissociation of accommodation and convergence in the typical cases has been most helpful. By teaching blurred vision with straight eyes, gradual clearing of vision with straight eyes, and the consciousness of diplopia when convergence occurs, hyperopes of 4 diopters or less may learn to stay straight without glasses, and still see adequately. I should guess that 50 percent of typical accommodative esotropes may learn to live happily without glasses for constant wear.

The third and final group benefiting greatly from orthoptic training are the cases of moderate divergence excess. I have the feeling that over one half of the cases having a divergence of 20 diopters or less can be taught to maintain straight eyes at all times except when ill or extremely fatigued. Divergence of more than 20 diopters can rarely be treated by orthoptics alone, but must have one or both lateral rectus muscles recessed, as well.

Orthoptic procedure is most helpful as an adjunct to surgery in obtaining a final cure in the more mechanical types of strabismus. I personally do not emphasize presurgical, but do stress postsurgical, orthoptic training.

May I point out, with Miss Roth, that any degree of success in treating any type of squint requires not only an interested, intelligent patient, but also interested and intelligent parents? Lack of interest will defeat the most sensible and persistent training program.

DIVERGENCE EXCESS: AN ANOMALY OF THE EXTRAPYRAMIDAL SYSTEM*

ELECTRA HEALY
Chicago, Illinois

A review of the literature concerning the condition known as divergence excess revealed the fact that not only are we progressing in our knowledge of this particular condition, but that many of the facts are, and will be, applicable to other types of ocular muscle imbalance as well.

Since there seems to be some variance in definitions given by the different writers on this subject, I should like to make my own understanding of divergence excess clear by quoting from a paper by Berens, Hardy, and Stark, which was read before the American Ophthalmological Society in 1929:

"We characterize as divergence excess that ocular muscle imbalance exhibiting an exophoria more marked when the gaze is directed into distance than when it is adjusted for near vision, combined with normal prism convergence and near point of convergence and an excessive ability to overcome the diplopia caused by prisms placed base in before the eyes. The lateral movements of each eye should be normal and comitant."

The incidence of divergence excess in our office for the past 5-year period—the length of time our orthoptic department has been opened—was approximately 0.8 percent of all eye conditions which required the services of an ophthalmologist, and two percent of all cases which were referred to the orthoptic department. The age of the patient at the time of the first visit varied from 3 to 62 years.

All patients were examined under cycloplegia, with the exception of the oldest patient. Although cases of hypermetropia predominated in this group, other types of refractive error, including compound and mixed astigmatism, and both hyperopia and myopia, were found. There was also one case of aniseikonia. Therefore, no significant correlation was found to exist between divergence excess and ametropia of any specific type. This is almost in complete accord with the data given by Berens, Hardy, and Stark. I feel that this is of particular interest, because of the lapse of time between the two findings and the different locations in which the studies were made.

One of the oldest theories to account for divergence excess, a theory which I believe I can safely say has been abandoned, was that of "weak muscles." Now this interpretation of weak muscles is not to be confused with the one of poor muscular tone caused by lack of exercise or some constitutional condition such as anemia or ill health, all of which may well contribute to weakened convergence power.

More recently, the theory that divergence is not a negative factor of convergence has been suggested by the possibility of an actual divergence center in the brain. The supposition that overstimulation of such a center is the cause of divergence excess remains unproved, however, to those who have worked with this type of squint. Bielschowsky's opinion that divergence excess is due to an anomalous position of rest, considering the anatomic arrangement of fasciae and ligaments of prime importance, is also unconvincing in the light of what may be obtained by orthoptic treatment.

Just what may be gained by orthoptic

* Read at the meeting of the American Association of Orthoptic Technicians, Chicago, October 14, 1946.

training? Through prolonged, conscientious, and ever-increasing effort in orthoptic training, much may be accomplished. All cases of divergence excess, even the very low percentage of cases requiring surgery, need the additional stimulus that orthoptics can give, more than they need any other one aid in correction. Why is this so? Because orthoptics teach correct habits and skills. If anomalous correspondence is present, it may be corrected by reëducation through fusion stimulation, and by the development of a large amplitude of fusion. The proper relationship between accommodation and convergence may be established and suppression overcome, all because these conditions are established by the cerebral cortex, the center of learning.

Does all of this effect a cure? That depends entirely upon the definition of a "cure." I like to think of a cure as being absolute and habitual at all times and under all circumstances; if that is meant, then the answer is "no." Although these patients may be taught to accomplish the highest standard of "mechanical cure" and transfer it to their "casual seeing," there are still times when deviation is manifest, without the patient's awareness of it, for only rarely is spontaneous cross diplopia noticed by the patient.

This inability, on the patient's part, to know when the eye is divergent—even in view of the satisfactory experience that binocular single vision gives—may be accounted for by the complete absence of any conscious sensation of the position of the eyeball, or even further by the apparent absence of a definite proprioceptive mechanism in the ocular muscles. If this were not so, nerve impulses reaching the central nervous system would give information concerning tension of the muscles and relative position of the eye. In sleep, when the cerebral cortex is inhibited, the eyes assume a divergent and upward rotation; but upon awakening, the "fixation reflex" and "attention mechanism," both prompted by the higher level of cortical control, bring them into parallelism. However, relaxation of attention or daydreaming affords opportunity for the unnoticed divergence of the eyes.

Normally, during this period of relaxation, the eyes are held in correct position by synergy or postural tonus. The innervations responsible for these correct positions of the eyeball may resemble those of other muscle systems of the body in being of two types. One consists of conscious perception and volitional direction, as served by the pyramidal tract from the motor cortex; the other, which does not require the attention of consciousness and which effects involuntary adjustment, is subserved by the extrapyramidal system. An anomaly lying somewhere in this little known system accounts for the failure that occurs when the "fixation reflex" or "attention mechanism" is not in complete control.

Conclusion

1. Divergence excess occurs in one to two percent of all cases in the private practice of ophthalmology.

2. Divergence excess is not correlated with refraction.

3. Orthoptic treatment is the most satisfactory correction method employed today because it corrects, to a great extent, the neurologic factor.

4. Divergence excess is an anomaly of the extrapyramidal system, and research in this field is urgently needed.

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NOTES, CASES, INSTRUMENTS

GLAUCOMA TREATMENT*

P. WEINSTEIN, M.D.
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Since glaucoma is the most frequent cause of loss of sight, its treatment is one of the outstanding problems of ophthalmology and its prevention can be regarded as a national service. Research into the etiology of this disease, study of statistics based on large numbers of cases, rationalization of operative treatment, and analysis of drug therapy are the materials from which ophthalmologists forge the weapons for combatting this disease.

The ophthalmic clinic of Budapest University under the guidance of its late director, Prof. Emil Grosz, undertook extensive work along these lines, and it was the privilege of this writer to take part in the work. The experience gathered from the investigation of several hundred cases during this work and from operations on many patients at the ophthalmic department of the Jewish hospital at Budapest has led not only to the writing of this paper, but also to the observation which is this paper's most noteworthy contribution to the study of glaucoma; namely, that spontaneous venous pulsation signifies a more favorable retinal circulation and that retinal nutrition is less impaired in those patients having spontaneous venous pulsation than in those in whom it is lacking.

Professor Grosz in his last two lectures on glaucoma delivered in 1939 at Nancy and in London (Hunterian lecture) summed up the experience gained from performing 4,927 operations. He outlined instances in which surgery is indicated as follows:

1. Iridectomy in cases of inflammatory glaucoma.
2. Iridectomy in cases of acute inflammatory glaucoma which react to pilocarpine-lowering of the tension.
3. Posterior sclerotomy followed by cyclodialysis and subsequent iridectomy in cases of acute glaucoma which do not react to pilocarpine.
4. A trephining operation as the first treatment, followed by cyclodialysis, for chronic inflammatory glaucoma.
5. Lagrange's operation followed by cyclodialysis in cases of glaucoma simplex.

Grosz believed that cyclodialysis could be regarded as less dangerous than trephination, but he also recognized that, in trephination, the immediate results, as well as the later effects, are more favorable. The advantage of cyclodialysis, however, is that it can be repeated several times. Insufficient knowledge as to the processes which produce the effects of these operations was, in Grosz's opinion, the contributing factor to the surgeon's inability to make a rational choice.

Experience with many cases in Grosz's clinic demonstrated the fact that posterior sclerotomy in cases which did not respond to pilocarpine during the acute attack resulted in quite transitory decrease of tension; so there was little sense in applying it. Likewise, cyclodialysis contributed little to the lowering of tension during an acute attack. (Goldman says that it is effective only in cases in which the eyes possess deep chambers.)

My experience, based on 346 operations, shows that iridectomy for prodromal and acute glaucoma improved by pilocarpine gave excellent results in 188 cases. In 26 cases which did not respond to pilocarpine during the acute attack and in which the possibility of subsequent

* From the Department of Ophthalmology of the Hospital of the Jewish Community at Budapest.

hemorrhage or expulsive hemorrhage excluded iridectomy, I applied Lindner's posterior trephination as a preparatory step and followed this in two or three days with iridectomy. Soon after Lindner's trephination, the tension decreased; the chamber deepened; and the opacity of the aqueous humor, sometimes rich in proteins, disappeared in every case within a few days. By itself, Lindner's trephination is insufficient. In six cases of absolute glaucoma in which posterior sclera trephination was the only treatment, the eye hardened again within six to eight days.

In 53 cases, I applied Heines and later von Sallmann's cyclodialysis. The results were unsatisfactory. Since I had had ample opportunity in Grosz's clinic to follow cases in which the eyes had hardened again after repeated cyclodialysis, I resolved to treat every case of chronic inflammatory and simple glaucoma by Elliot's trephining operation and, to date, I have done so in 57 cases.

The mechanism of the surgical procedures just described have been elucidated by the investigations of Fr. Kiss,[1] professor of anatomy at Budapest University. According to his views, the circulatory system of the ciliary body has been divided into two contradistinctive parts: (1) grossly entwined vessels serving filtration (the ciliary process); (2) thin-walled vessels serving absorption (the ciliary plexus). The beneficial effect of cyclodialysis is due to the liberation of the suprachoroidal space whereby the finely interwoven system of the ciliary plexus becomes free, its circulation accelerates, and absorption increases.

Actual observation confirms that, after cyclodialysis, hyphemia disappears with astonishing rapidity within the chamber, while after iridectomy hyphemia lasts for several days. Kiss's explanation is, therefore, plausible enough and a contradiction to other theories (Heine, Elschnig). It is a fact, however, that cyclodialysis is ineffective in 50 percent of cases (Grosz). Obviously, this is so because the formation of synechias obliterate the ciliary plexus, its circulation is impeded and with it, absorption.

Kiss's theory explains that the chamber deepened by Lindner's trephination gives free access to the ciliary body and, thereby, improves conditions for iridectomy. The lasting decrease of tension in Elliot's trephining operation has to be ascribed to filtration and partly to the developing of the vessels (Sondermann) which connect the episcleral veins (anterior ciliary vein) and the ciliary plexus, thereby facilitating drainage.

Since there are cases which, despite iridectomy, repeated cyclodialysis, and Elliot's trephining operation, become hard again and do not react to the 1- to 2-percent pilocarpine solution administered in the conventional manner, I have established a new treatment.[2] Satisfactory results have been achieved in such cases by administering a combination of 1:1,000 adrenalin, ½- to 1-percent pilocarpine and, once or twice weekly, 1-percent adrenalin. I have treated numerous cases which remained hard despite operation and the usual pilocarpine treatment and which became permanently soft after this therapy.

During 1944 and 1945, when many glaucoma patients were confined to the ghetto at Budapest and there was no adequate medical treatment nor pilocarpine available, valuable observations could be made.

It was from the detailed examination of these patients and from comparing their fundi with fundi which had been altered by such conditions as high myopia, atrophy of the optic nerve, and so forth,

that we came to the impelling conclusion which is the salient feature of this communication.

Spontaneous venous pulsation signifies a more favorable retinal circulation and where it is present, retinal nutrition is less impaired. Under such circumstances, the increase of blood pressure according to Lauber-Sobansky as a means of general treatment of chronic glaucoma, concomitant with a decrease of venous pressure, may be justified.

Summary

Iridectomy is the operation of choice in cases of prodromal and acute glaucoma responding to pilocarpine by decrease of tension.

Acute glaucoma not amenable to pilocarpine should be treated by Lindner's trephination followed by iridectomy after two or three days.

Elliot's trephining operation is indicated in cases of inflammatory chronic and simple glaucoma.

After-treatment of suitable cases is favorably conducted by the administration of a combination of pilocarpine and adrenalin.

For general treatment, decrease of venous pressure is suitable.

Whatever operative procedure is executed, after-treatment has to be conscientiously followed.

V., Személynök-u. 9-11.⅓3.

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SOCIETY PROCEEDINGS

Edited by DONALD J. LYLE, M.D.

BROOKLYN OPHTHALMOLOGICAL SOCIETY

October 24, 1946

PSEUDOTUMORS OF THE MACULA

DR. RALPH I. LLOYD presented a paper on this subject in which he considered the differential diagnosis of macular disease including consideration of histologic reports as well as clinical history. The vascular degenerative and neoplastic processes were given detailed analysis, their obvious distinctions and often confusing similarities were emphasized. The lecture was supplemented by excellent Kodachrome slides.

OBSERVATIONS ON TRACHOMA WITH SPECIAL REFERENCE TO A "CARRIER STATE"

DR. MARTIN BODIAN spoke on a study of a group of natives working at an American Army Base in Fiji which showed that 22 percent were found to have active trachoma. Of these, 68 percent showed Prowazek-Halberstaedter inclusion bodies on conjunctival smears. Of those natives who were free of trachoma, 34 percent had conjunctival inclusion bodies. These inclusion bodies were found to be identical in every respect to those found among the trachomatous patients. It is felt that this is suggestive of a carrier state in trachoma. American troops living in this endemic trachoma area for long periods of time under hygienic conditions showed no clinical or laboratory evidence of the disease.

George A. Graham,
Associate Secretary-Treasurer.

SOCIEDAD OFTALMOLOGICA DE MADRID

June 14, 1946

INTRAOCULAR FOREIGN BODY UNKNOWN TO PATIENT

DR. CARRERAS presented a case in which the patient not only did not know that he had a foreign body in his eye but denied ever having received an injury to the eye which could have made the presence of a foreign body possible.

The patient had a history of slowly losing the sight of his right eye for a couple of years. He complained that now he had pain in the right eye and some photophobia in his good left eye, which latter fact disturbed him greatly. Examination showed an enormously deformed globe.

The media were normally transparent, but in the cornea could be seen, by means of the slitlamp and corneal microscope, a very thin, peripheral linear cicatrix which comprised the whole thickness of this membrane. The ophthalmoscope showed atrophy of the papilla and a glaucomatous excavation. In the lower-outer section, near the equatorial region of the eyeground, could be seen a large atrophic plaque of chorioretinitis, of irregular outline and irregularly pigmented. Tension was 50 mm. Hg, and the diagnosis was chronic simple glaucoma, secondary to an intraocular foreign body, in spite of the negative history.

As the patient was anxious to conserve the eye, a cyclodiathermy puncture according to Vogt was attempted. Although the tension fell to 20 mm. Hg, there appeared on the fourth day, in addition to pain, a hyphemia which filled the whole anterior chamber and which showed no

tendency to resorption. In view of this, the eye was enucleated. On examining the enucleated globe, a metallic particle was found imbedded in the choroid, thus confirming the clinical diagnosis.

The rarity of this case is found principally in these two points: (1) The patient was completely unaware of the initial trauma. (2) Secondary glaucoma developed without siderosis bulbi.

Unawareness of the injury which caused the penetration of a foreign body can be satisfactorily explained, if we grant that it might have happened in infancy or that a sterile particle from a work tool penetrated the eye with great velocity causing only slight pain and slight redness of no importance.

The manifestation of a foreign body in the form of glaucoma without siderosis is something of great rarity in ophthalmic literature. The pathogenesis raises many difficulties. We may say it is a case of glaucoma through retention or through deficiency of drainage due to the obstruction of the trabecular tissues of the pectinate ligament by the oxidation products of the iron.

Discussion. Dr. Marin Amat congratulated Dr. Carreras on the study of the chemical analysis of the ocular contents of the patient and suggested that the histopathologic analysis of the retina would have been as interesting as it was in a case of his own which he presented, in 1934, to the Ophthalmological Society of France. In that case, with a dye of ammoniated silver, he showed in the retina the presence of many microglial cells, microphotos of which were published in the *Bulletin* of the Society and in the *Annales D'Oculistique* of Paris with the original work.

Dr. Mario-Esteban. The case presented by Dr. Carreras is very instructive not only because of the long presence of an intraocular foreign body, unknown to the patient, but principally because of the histopathologic reactions and the biochemical reactions which such a tiny particle could arouse to produce glaucoma.

Dr. Carreras (in closing), replied to Dr. Martin Amat. No anatomic examination of the eye was made because it would not have taught us anything, which is what one seeks in the study of the things gained by surgery. We all know that our ignorance of the pathogenesis of primary glaucoma is due, above all, to the difficulty of obtaining glaucomatous eyes in the first stages of the disease, in order to study them from the viewpoint of the first changes. Old glaucomatous eyes show us lesions which are the result of the disease and not the cause of it. This is a case of absolute glaucoma, of at least two years' duration, and a study of the changes found in this eye would have taught us nothing new.

In his reply to Dr. Mario-Estaban Dr. Carreras thanked him for participating in the discussion of the case presented, and said that his remarks were always interesting and carried the value of his large and rich experience. Dr. Carreras said that during our war of liberation there were many foreign intraocular bodies unknown to those who had them. He could attest to that since he was chief of the ophthalmological service of the six hospitals in Cadiz. However, what is frequent and natural in war where in the excitement of combat a soldier may be unaware of the trauma caused by a projectile is quite a different matter in times of peace where one generally takes note of the slighest injuries save in exceptional instances as seems to be the case in our patient.

A PARTICLE OF IRON IN THE VITREOUS REMOVED BY THE SCLERAL ROUTE

DR. MARIN AMAT AND DR. GARCIA MANSILLA presented a patient from

whose eye a foreign body was extracted within 18 hours after its penetration. The following technique was used.

Retrobulbar anesthesia was performed with 2 cc. of 4-percent novocain to which a drop of adrenalin (1:1,000) had been added. An injection of 2 cc. of 2-percent novocain with two drops of adrenalin (1:1,000) was made in the lower-outer quadrant of Tenon's capsule beneath the external rectus and the inferior rectus muscles. Superficial anesthesia was obtained with 4-percent cocaine.

1. A nonmagnetic eye speculum was placed and an incision was made in the conjunctiva and Tenon's capsule in the lower-outer quadrant along the 4:30-o'clock meridian, exposing a large section of the sclera.

2. A silk thread was placed under the external and the inferior rectus, and these muscles were drawn upward and inward so as to expose the sclera.

3. The large cone of the giant electromagnet was applied to the sclera in order to attract the foreign body.

4. Diathermy coagulation of the anteroposterior surface of the sclera was done in the same meridian to avoid hemorrhage of the choroid.

5. Three interrupted and equidistant sutures were placed between the lips of the conjunctival wound in order to tie them immediately after extraction of the foreign body so as to avoid loss of vitreous.

6. An anteroposterior incision of some 5 mm. was made with a Graefe knife along the line of coagulation in the sclera embracing this membrane and the choroid. This was done without the least hemorrhage.

7. The long, thin part of the electromagnet was introduced into the vitreous, and by using the proper current and leaving it in for several moments, the foreign body was extracted. This proved to be a piece of steel of the form shown in the X-ray film. There was no loss of vitreous.

8. The sutures, already prepared in the bulbar conjunctiva, were tied. At the end of the operation a drop of sterile 1-percent atropine and 4-percent mercurochrome were instilled in the eye and a monocular bandage was applied.

As a preventive measure, the usual dose of cibazol, internally, injections of cebione, and later calcium chloride, orally, were prescribed. The postoperative course was uneventful. There were no hemorrhages and only a very slight oozing of vitreous during the first three days, which afterwards completely disappeared. On the fourth day vision was 6/6. The conjunctival sutures were removed on the 10th day, and by the 14th day of the accident, there was a complete cure with 6/6 vision in both eyes and no incapacity.

Discussion. Dr. Mario-Esteban agreed with Drs. Marin Amat and Mansilla that the scleral route is the best for extracting foreign bodies located in the posterior segment of the eye. It is a more efficient and harmless procedure than the anterior route. I presented a similiar case last year before this society to emphasize this point.

I think it is a wise procedure to produce superficial electrocoagulation as a prior step to sclerotomy, not only in order to prevent hemorrhage but also to avoid a secondary detachment of the retina. To this end it may also be advisable to cut the ocular membranes with an electric bistoury instead of with a knife.

Dr. Marin Amat (in closing), said that he wished to answer, at the same time, Drs. Mario Estaban and Carreras, and to affirm that he considered his technique of coagulation of the sclerotic and choroid and incision with the Graefe knife superior to their method of cutting the membranes with the electric knife. His reason is that the diathermy coagulation produces a better coagulation than is pro-

duced by perforation with a metallic filament. He feels so strongly about this point that every time he has to perforate the eye in the treatment of retinal detachment in order to let the subretinal fluid escape, he always does it over a region which has previously been coagulated so that there will be no complication of intraocular hemorrhages.

With reference to the probable subsequent detachment of the retina, it is clear that it could happen, but Dr. Marin Amat has never seen it. The preceding coagulation of the sclera and choroid would produce an exudative choroiditis. This would logically prevent such an occurrence by producing an adhesion of the two intraocular membranes along the site of the incision. Moreover, he performs posterior sclerotomy in the iridectomy operation for glaucoma, without getting subsequent detachment of the retina.

Joseph I. Pascal,
Translator.

CHICAGO OPHTHALMOLOGICAL SOCIETY

April 15, 1946

PETER C. KRONFELD, *president*

CLINICAL MEETING

(Presented by the staff of Loyola University Medical School, Department of Ophthalmology)

MALIGNANT EXOPHTHALMOS

DR. J. R. FITZGERALD presented I. M., a woman, aged 47 years, who was seen in consultation in November, 1944, when she was admitted to the hospital for thyroid surgery. The ocular symptoms consisted of lid swelling, epiphora, and a severe and constant neuralgic pain located behind the eyes. A firm, noninflammatory lid edema was present, as were a nonobstructive and marked epiphora, and a marked retraction of the levator, but no significant exophthalmos. Other ocular findings were normal. Basal-metabolism rate was +39. Following complete ablation of the left lobe and removal of about 90 percent of the tissue of the right lobe of the thyroid, the systemic manifestations of thyroid overactivity disappeared, but the eye symptoms were not improved.

About one month following surgery it was quite evident that malignant exophthalmos was developing. Exophthalmos measured 25 mm. (Luedde) in each eye, and there was considerable resistance on attempts to compress the eyeballs into the orbit. Lid swelling and epiphora were much more apparent; the lacrimal gland was papable; diplopia was constantly present with complete immobility on attempts to rotate the eyes into the superior plane. The diplopia could be obliterated in the primary position by 6 diopters of vertical prisms. The ocular muscles could be palpated and seemed enlarged and taut. Reaction to prostigmine was negative. Vision was: O.D., 20/200, correctible to 20/20; O.S., 20/100, correctible to 20/25. The refractive error was a mild, compound myopic astigmatism. Visual fields were normal.

Six weeks following surgery the ocular situation had further deteriorated. There was almost complete external ophthalmoplegia, inferior rotation being retained to some extent. Severe chemosis was present with exposure keratitis manifest by superficial, punctate staining of the lower half of each cornea. The basal-metabolism rate was −7. The patient was again hospitalized and given 6 gr. of thyroid extract, daily; stilbestrol, 10 mg. daily; fluid limitation; sedation; local protective ocular therapy; and irradiation of the pituitary gland. X-ray studies of the sella turcica were negative. The re-

sponse within one week was excellent. During the next few weeks, the ocular motility improved markedly with lessening of diplopia and subsidence of pain. Seven months following surgery, the diplopia had disappeared subjectively; approximately 1.5 degrees of vertical imbalance remained. The exophthalmos still measured 24 to 25 mm. (Luedde). Rather complete paralysis of elevation remained; left lateral conjugate rotation was also slightly impaired. Cosmetically, the levator retraction is still a problem and a recession by the Goldstein technique is contemplated.

Siderosis of lens and vitreous

Dr. J. R. Fitzgerald presented E. L., a man, aged 34 years, first seen in December, 1945, because of impaired vision in the right eye of 10 years' duration. He had been told, in 1936, that he had a congenital cataract. Vision was: O.D., 20/60, correctible to 20/30, no Jaeger; O.S., 20/15, J1 for near. In the right eye, a 2 to 3 mm., through and through, linear and vertical corneal scar was seen, located paracentrally at the 2:30-o'clock position, opposite the pupillary margin of the iris. A peculiar lens opacity, consisting of a dense brownish opacity surrounded by a cuff of whitish tissue, was located at the superior pole of the lens in the cortical zone, from which, extending downward toward the lenticular center, were two similarly colored pronglike opacities resembling the roots of a tooth, located in the anterior and posterior cortical zones. The posterior subcapsular zone was greenish-yellow.

Vitreous strands were thickened and clumped, nasally and below, and stained deep brown. A red reflex was present, but fundus details were too indistinct to be studied. Repeated tonometric examinations were within normal range. There was no evidence of active or past inflammatory reaction; no atrophic changes were present in the iris; and no hole was visible. On maximal pupillary dilation, a small capsular rent was visible just inferior to the equator slightly nasally to the 12-o'clock position. X-ray pictures showed a small, metallic foreign body located somewhere in the anterior orbit or eyeball.

Additional history disclosed that, in 1932, while repairing a battery, something struck the patient's right eye. He consulted a doctor but nothing was found, and the eye healed without incident. In 1942, he was inducted into the army and was promptly hospitalized because of troublesome headaches. He spent four months in the hospital. Numerous X-ray studies were made. He believed that an intraocular foreign body was suspected, but no diagnosis, advice, or therapy was given.

Cataracta complicata: myopia

Dr. E. A. Roling presented S. C., a woman, aged 50 years, who was first seen in November, 1942, complaining of poor vision in both eyes. She stated that at five years of age she was struck in the right eye with a pellet from a slingshot, causing loss of vision. She was told at the time that she had a retinal detachment; no therapy was instituted. Vision has remained poor in that eye, and for the past several years vision in the left eye had gradually decreased. She had worn a correction for myopia for 20 years.

Vision in the right eye was ability to count fingers at six inches; in the left eye, 20/100. The right eye showed a mature cataract suggestive of cataracta complicata. There was good projection and perception of colored light, with a faint red reflex at the periphery of the lens. The left eye also showed an opacity of the lens, suggestive of a cataracta complicata, not so marked as in the right. The vitre-

ous was degenerative, the fundus showed degenerative myopic choroiditis.

One year later vision in the right eye was unchanged; that of the left eye had decreased to less than 20/200. A lens extraction was performed in the right eye. The postoperative course was slow but uncomplicated. Three months later vision could be corrected to 20/40; and one month later, with correction: −50D. cyl. ax. 90°, a vision of 20/25 was obtained; with a +3.00D. sph. added, she read J2 at 12 inches. Funduscopic examination showed moderate vitreous degeneration and degenerative myopic choroiditis, less in degree to that of the left eye.

Retrobulbar abscess

Dr. E. A. Roling presented P. A., a man, aged 50 years, who was first seen in September, 1945, with marked proptosis of the left eye. The lids were edematous and inflamed, and thick rolls of phlegmonous conjunctiva extruded through the palpebral opening. The bulb was completely frozen in the swollen soft tissues of the orbit. The cornea was exposed over the lower two thirds and was hazy. The media was cloudy, and fundus details could not be made out. Vision in the right eye was 20/40; in the left eye, nil. The patient's temperature was 102.4°F.

Three days following extraction of a tooth, two weeks previously, the left eye became red and painful. The eye was treated with hot applications, and sulfonamides were administered without improvement. Ten days after onset, the patient consulted an ophthalmologist and was immediately admitted to the hospital.

Under sodium-pentothal anesthesia, an aspiration of pus was attempted in order to localize any pocket of purulent material in the retrobulbar space. This was unsuccessful, and an incision was made through the skin at a junction between the inner one third and outer two thirds of the orbit, just inferior to the superior orbital rim. Exploration was continued with blunt dissection until an abscess was encountered. A rubber drain was inserted deep in the retrobulbar space and the wound was left open. Therapy with penicillin and sulfadiazine in large doses was instituted. The wound drained freely; the temperature dropped; and the inflammation gradually resolved. At no time was there evidence of meningeal irritation. Vision in the right eye returned to 20/25, and the left eye remained blind. Two months later, there was only slight impairment of the ocular motility and beginning optic atrophy in the left eye. At present the ocular motility is normal, the optic nerve is atrophied, and there is a slight symblepharon of the lower lid.

Scientific program

Complications of intracapsular extraction. Dr. Samuel J. Meyer.

Peripheral vision and experimental anoxia. Dr. Ward C. Halstead (by invitation).

Subdural hematomas in infants and adults. Dr. Frank W. Walsh (by invitation).

Richard C. Gamble,
Secretary.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

March 19, 1946

Dr. Howard F. Hill, *presiding*

Penicillin in Ophthalmology

Dr. Edwin B. Dunphy said that penicillin is usually superior to the sulfonamides for the following reasons:

1. It is generally nontoxic by all routes of administration.

2. Its antibacterial action is not in-

hibited by autolytic products and secretions.

3. It has little, if any, deleterious effects on the regeneration of corneal epithelium.

4. It is not incompatible with other drugs commonly used, such as atropine, cocaine, procaine, sulfadiazine, and so forth.

With these advantages, Dr. Dunphy said, it should be the drug of choice in treating any ocular infection known to be due to penicillin-sensitive organisms.

However, unless certain basic facts are understood regarding its distribution in the ocular tissues by various methods of administration, many cases will not be treated effectively, and much valuable time will be lost before the ocular infection can be brought under control.

The weight of experimental evidence seems to indicate the following recommendations for treating eyes infected with penicillin-sensitive organisms.

1. Intramuscular and intravenous injections of penicillin will probably have little effect in controlling infections of the anterior and vitreous chambers.

2. Subconjunctival injections may have some effect on infections of the anterior chamber, but are probably worthless in infections of the vitreous.

3. Injections of the vitreous can probably be most effectively treated by a single intravitreal injection of 0.1 cc. of penicillin solution containing not more than 500 units.

4. Infections of the anterior chamber will probably be controlled by local application of saturated cotton packs, or by iontophoresis. Corneal baths and subconjunctival injections will probably be less effective. In cases of perforating corneal injury with damage to the lens, a single injection of 0.1 cc. of a solution of penicillin containing not more than 500 units may be justified.

5. For conjunctivitis and infectious corneal ulcers, frequent instillations of penicillin drops or ointment will probably be effective. Saturated cotton packs under the lids, iontophoresis, or corneal baths should be tried in very severe cases.

Mahlon T. Easton,
Reporter.

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ESTABLISHMENT OF AN AMERICAN BOARD OF OPTICIANRY

One of the most vital elements in the practice of many ophthalmologists is the opticians to whom they refer their patients for the filling of their prescriptions.

There are those ophthalmologists who are so situated that they cannot allocate this phase of their practice to an optician and who must, therefore, handle it themselves, and there are a few to whom the service is available but who do not care to use it, for one reason or another, but for those who have been fortunate enough to have had an association with a well-trained optician, there can never be enough said in praise of this helpmate.

How often has he borne the brunt of complaints for unsatisfactory glasses, and often, I am sure, when the blame should have been placed elsewhere! How

often has he made requested adjustments and changed lenses without charge to the patient in order to be of service to the physician. His must often be a trying and difficult task. At times, because of his better knowledge, perhaps, of newer designs in frames and bifocal segments, and even—be it hesitantly suggested—better information on practical optics, on him falls the burden of suggesting tactfully to the doctor that certain changes be made in the construction of the lenses.

There are some opticians, naturally, who are not so well trained, even if equally well intentioned, as others, and it is because of this fact that the idea for some means of educational standardization for opticians was born. It is recognized that many good opticians have risen from the ranks of errand and bench boys in the shops, having been trained only by the method of practical instruction and such reading as they cared to do on the subject. Although some of them have made a good job of it, the fact remains that many are inadequately trained and that there is an enormous difference in their qualifications.

Today the demand for more thoroughly trained opticians is even more pressing than in the past because of the great advances in lens construction with the incident increase in variety of optical possibility offered to the public. To be conversant with what is best for the patient involves a knowledge of optics, of lens making, and of many kindred subjects including a reasonable understanding of ophthalmology.

An ophthalmologist who has had particular awareness of the need for better instruction for opticians has been Dr. William L. Benedict, Director of the Ophthalmological Division of The Mayo Clinic. Primarily through his efforts, there has been initiated in the Rochester Junior College a two-year course in Opticianry, a term coined by Dr. Benedict. The theoretical instruction is given under the auspices of the school and the practical work by officers in the Benson Optical Company.

With full realization of the need for some means of evaluating the education of opticians and of standardizing their training, a group of those interested met in Chicago in January of this year and undertook the organization of an American Board of Opticianry. The model was that of the American boards of various specialties in which the American Board of Ophthalmology was the pioneer. The following organizations were instrumental in formulating the idea, and their representatives were included in the plans for the Board:

1. American Society of Contact Lens Technicians.
2. Association of Independent Optical Wholesalers.
3. Guild of Prescription Opticians of America.
4. Optical Wholesalers National Association.

Among the guests was William L. Benedict, M.D., who, by invitation, read a paper on "Recommendations for Creating a Board of Registration for Opticians." Charles Sheard, Ph.D., then emphasized the importance and necessity of adequate education to be followed by an apprenticeship of several years with final examination and certification by the Board of Opticianry as "Master Ophthalmic Optician."

There was to be an advisory educational and professional council to ". . . consist of not less than three and not more than five members, one of whom shall be engaged in the practice of ophthalmology, one engaged in the practice of optometry, and one who shall be an educator and/or research worker in ophthalmological optics or in the broader

field of physiological optics. . . ."

An outline of a two-year course of training has been sketched. This is to be followed by at least a five-year apprenticeship before the candidate is permitted to apply for certification as Master Ophthalmic Optician. A list of those companies, groups of individuals, or individuals who have been accredited as satisfactory for giving the practical training is to be published.

This training is specified to consist of not less than one year of ophthalmic lens grinding with 40 hours per week, two years of ophthalmic lens finishing with 40 hours per week, and two years of ophthalmic dispensing with 40 hours per week.

The two ideas, one for the establishment of suitable schools for training in opticianry and the other for the formation of a Board of Opticianry, appear fundamentally sound. There is little on which to build at present so that the project will take a long time before it can function adequately. With courage and persistence and infinite patience, however, the purpose can undoubtedly be accomplished. Ophthalmologists and optometrists should give the idea wholehearted support. The former for reasons obvious to ophthalmologists, and the latter for the same reasons—although these are less obvious to ophthalmologists because many of them fail to realize that the practice of many optometrists in large centers is similar to their own in that some of them refer their optical work to opticians. Somewhat beside the point is the related thought that if and when optometrists make a charge to the patient for their professional services, as a very limited number now do, they will not need to depend for their living on profit from the sale of glasses or on rebates from opticians, as is often the case now; and this latter practice might, with ophthalmologists' coöperation, be stopped and the cost of glasses to the public be reduced.

Having digressed thus far, the writer cannot resist the temptation to reaffirm his often given views on the practice of ophthalmology as concerns refraction. The occasion is because among the excellent papers presented at the organization meeting of the American Board of Opticianry, one writer voiced the sentiment, so often heard from optometrists, that the logical ultimate division of fields of activities might well yield all refraction to optometrists. To this writer that would be the knell of ophthalmology as a specialty.

Half of an ophthalmologist's life is over by the time he has completed his professional training. Ten years more must elapse before his surgical practice amounts to much, even when he is most favorably situated. It is rare indeed for surgery to be his major source of income before he is 50 years of age, and there are many to whom this never occurs. The medical phase of his practice comes earlier. In the practice of most ophthalmologists, however, the medical and surgical parts are always secondary to the refractive portion.

If this is taken from them, only very large cities will be able to support an ophthalmologist. Even there, he would have so many lean years that the field would attract almost no one, and the specialty would have to be included with general surgery where it would languish and deteriorate, a step backward of a hundred years.

Furthermore, refraction of the patient completes the surgical or medical care of the case. It is so intimate a part of the patient's care that it cannot be satisfactorily divorced from it. Since it rounds out the whole treatment and is the logical termination of the case, it should be handled by the one who has

performed the surgery or given the medical care.

No, if there is ever to be general accord between ophthalmologists and optometrists, it must be on the basis of acknowledgment by both that the practice of refraction belongs naturally and legitimately to both.

Lawrence T. Post.

SENSITIVITY FROM TOPICAL USE OF SULFONAMIDES AND PENICILLIN: A WARNING

Recently, while combing the literature for newer developments in the field of ocular therapeutics, I was struck by the widespread, and at times indiscriminate, use of the sulfonamides and penicillin. These miracle-working drugs have a definite and important place in our therapeutic armament, but the indications for their use are now rather well defined and well understood. From the literature it seemed apparent that many ophthalmologists are unaware of the fact that the local use of these drugs, particularly the needlessly long use, may produce a sensitivity to the drugs that would prevent their life-saving use for a later, more serious general infection.

Induced sensitivity from topical use of the sulfonamides is well known to all dermatologists. The reaction consists of a dermatitis of varying severity. In the majority of cases the reactions followed the local use of the drugs in ointment form. It has been found that the local use of sulfathiazole in even infinitesimal doses can induce this sensitivity.

All of us are aware of the fact that ophthalmic ointments can cause a local reaction. This sensitivity is sufficient to produce a severe reaction if the drug is used systemically. In addition to the severe exfoliative dermatitis, the function of the kidneys may be affected, producing anuria, and the blood may show the well-known changes in its structure.

It has been said that, if an individual develops a sensitivity to one of the sulfonamides, another member of the group can be used without danger. There are, however, a number of instances in the literature where individuals who have been sensitized to one member of the group by means of local use have developed a severe dermatitis after the oral administration of another type of sulfonamide. Many internists are very reluctant to give any form of sulfonamide if the patient has ever had a skin reaction to any of the group. Indications are that this sensitivity may last many months and perhaps years.

Experience has shown that the local use of the sulfonamides in the eye is less apt to produce sensitivity than their use on the skin. The use of the sulfonamides in otolaryngology has confirmed the fact that their local use on the mucous membranes can produce sensitvity. There is a striking case reported in the literature of a man who used nose drops containing one of the sulfonamides. Later he developed a pneumonia for which he was given a sulfonamide. A severe exfoliative dermatitis and anuria followed, resulting in his death. There have been a number of authors who have condemned the routine use of the drug in the treatment of the common cold.

Although the generalized use of penicillin is more recent, it is also apparent that there is a tendency to develop a sensitivity to this drug. This sensitivity may be manifested as an immediate reaction or as a delayed one. The delayed or acquired sensitivity may be produced by repeated local application. Reactions have also been seen in the skin and eyelids of individuals who are in contact with the

drug during its preparation for administration. Tests have shown that this acquired sensitivity may be of short duration or it may last for a considerable period, even months, and it is conceivable that it may be permanent.

From the literature it is apparent that the serious ocular infections that respond to the sulfonamides and penicillin do so in a relatively short time. For example, in almost all of the reports on ophthalmia neonatorum the authors stressed the fact that the condition cleared in 24 to 48 hours in most cases and that all were cured before six days. In spite of this knowledge, it is customary in some quarters to use these drugs over a long period of time without regard of the possibility that the patient may be developing a sensitivity.

A personal discussion with Thygeson on this subject brought out some points that it seems well to emphasize: (1) Sulfadiazine is just as effective in the eye as other forms of the sulfonamides, is less toxic, and is less apt to produce sensitivity. (2) The sulfonamides should not be used longer than two months. (3) Unless there is some definite indication for penicillin, it should not be used; it is important to avoid the development of a sensitivity that would prevent its use in a more serious condition. (4) If penicillin is employed, it should be used at frequent intervals and should not be used locally longer than two weeks.

As ophthalmologists let us not jeopardize our patient's future by producing a sensitivity to these drugs as the result of their injudicious use for some rather trivial eye condition or as the result of their needless use over too long a period of time. It must be kept in mind that the sensitivity induced may mean the inability to use these life-saving drugs in later years when they alone can preserve life.

Frederick C. Cordes.

BOOK REVIEWS

MEDICINE IN THE CHANGING ORDER. Report of the New York Academy of Medicine, Committee on Medicine and the Changing Order. The Commonwealth Fund, 1947. 232 pages. Price, $2.00.

The New York Academy of Medicine organized a committee about four years ago for the study of modern trends in medicine. In this book the subject is fully discussed. The work was based on many original monographs about related subjects. The committee was composed of more than 50 distinguished doctors, nurses, and laymen. The product of their efforts is worthy of the group. The scope of the inquiry is tremendous and obviously a Herculean effort has been put into this book. In the reviewer's mind it is the most thoughtful publication thus far concerning the future of medicine in America and should be read by every physician because it concerns him most intimately.

After a preamble which discusses the origins of the present problems, reviews medical care as it has developed in America and also considers some of the reasons for the trends that it has followed, the status of medical care in rural and in urban areas is given.

A summary of recommendations on the extension of medical care in urban communities is divided into the needs of: (1) middle-income families, (2) the medically indigent; and (3) the indigent. The statement is made that for the middle-income families voluntary, nonprofit insurance plans should be provided and that these can best function through group-practice units. As complete coverage as possible, except for the hospitalization of chronic illnesses, should be provided. If necessary, government funds should be used to subsidize the

risks of establishment and early deficits. The medically indigent should be handled by prepayment, nonprofit insurance plans in which the patient pays only a part of the premium, the rest being met by local, state, or federal funds. The indigent should be cared for by improved facilities in tax-supported municipal hospitals and health centers, with municipal subsidies to improve nonprofit institutions and staffs. A panel of physicians should give office and home care to these people. A medical committee should be set up in each city for advising the municipal agency that extends government subsidies to health institutions and to nonprofit insurance plans.

Situations in rural districts, which are much worse than in urban areas, are to be met primarily by an expansion of federal, state, and local public-health services. Qualified doctors, whose salaries are augmented by municipal, federal, or state grants, should be employed. Mobile clinics are recommended and, as the heart of the undertaking, new hospitals and health centers are to be strategically distributed throughout the country. Here again federal funds are to be utilized, the amounts depending on the local situation.

The next chapter considers the extension of the aforementioned public-health services which are now fairly adequate in some few states, only partially adequate in some others, and completely inadequate in the remainder. A recommendation is made that the federal administration consolidate all health functions in the Public Health Service and that this should eventually be elevated to departmental status. A consolidation of state health activities is badly needed. Too many departments, such as Welfare, Labor, and Agriculture, are involved in the present arrangements.

The quality of medical care, as distinct from the quantity, is stressed, it being recognized that the two are not necessarily interdependent and that if the quality deteriorates, the increase of quantitative care is futile.

Education of medical students, particularly the abandonment of discriminiation against women and minority groups, is discussed together with the present economic discrimination. Pertinent suggestions are that preventive medicine should be employed to a greater extent than at present. Each case should be studied with the thought in mind as to why the condition was not forestalled. It is also suggested that the student should have more instruction in medical practice in the home than he now does. Economics point to the impossibility of giving good medical education at a price that the student can pay. Government aid seems the answer to the writers of this book.

Another thought is that clinical training should begin with the first year of medical school, and that the basic courses should not be given in an isolated manner but directly in relation to the care of the patient. For the best training of interns they should be under the supervision of the medical school. Too often an intern is merely an employee of a hospital and carries such a mechanical burden that he does not have time to advance intellectually. It is argued that medical schools should have some contacts with their graduates' training. The idea is advanced that possibly medical schools, presumably accepted ones, might well have the licensing power of the physicians whom they have taught. Then follows a discussion of group practice. To the writers this seems to be a most desirable development.

A chapter on preventive medicine

points out as a preliminary that preventive medicine applies to those practices which only the individual is capable of applying to his own benefit; whereas, public health is a community responsibility. Prevention is tremendously stressed. The physician should be prepared to advise the patient not only on how to get well, but on how to keep well, and every individual should be educated to the importance of demanding this information from his doctor.

The history of the development of hospitals in America is a fascinating chapter. It discusses many aspects, not the least important being the financial, which includes the increasing costs to patients of hospital care. The necessity of this in the overall expanded program is, however, obvious. This chapter concludes with 22 recommendations for more efficient hospitals. Among these, the most important are a further integration of in-patient and out-patient services, with the enlargement of the latter and the extending of the hours of service into the evenings. The need for more graduate practical nurses is given. In this instance, as in others, the unequal distribution of service is mentioned. In New York state, the ratio of graduate nurses to population, in 1943, is given as 1:620; while in Mississippi, it was only 1:4,958. Although many more trained nurses are needed, the urgency for practical nurses is, perhaps, even greater.

Perhaps the crux of the whole problem is contained in the discussion of medical insurance. The committee strongly urges an extension of the voluntary insurance plans, which have been tried in many states and which, in general, have proved successful, rather than the establishment of drastic and irrevocable compulsory, health-insurance schemes, such as those outlined in the Wagner-Murray-Dingell bill, which have no experience to back them.

A glance at the italicized paragraph headings of this culminating chapter, gives one a fair idea of the whole discussion. "In extending medical service and perfecting its organization, quality must be preserved. Provision of public health services is a prime essential. Improvement in medical service requires effective use of hospitals with adequate facilities. Success will require trained professional and nonprofessional personnel. For optimal results, organization and coöperation of physicians are required. In the improvement of medical services, voluntary prepayment plans are needed. Extensive education for both physicians and the public will be required. Progress in the extension of medical service must be varied and adapted in each instance to the needs of the community. Government aid will be required."

Lawrence T. Post.

TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM. Volume LXV. London, J. and A. Churchill, Ltd., 1945. 424 pages.

The abundance of medical and surgical material cast off by war has always been followed by advances in medical knowledge and surgical skill. The excellent "Discussion on the Ocular Sequelae of Head Injuries" and the "Discussion on Plastic Repair of the Lids" carry the weight of authority gained from actual experience. The ocular sequelae of head injuries are presented in the following order: (1) optic nerve, (2) optic chiasma, (3) optic tract and radiations, (4) visual cortex, (5) visual disorientations,

(6) neuromuscular aspects, (7) the visual fields, and (8) the orthoptic treatment of ocular muscle imbalance following head injuries. This is controversial. The psychological benefit is noted frequently.

"The technique of plastic surgery is like that of eye surgery. Every maneuver must be precise, purposeful, clean, and finished. The handling of tissue must be the minimum." This quotation from Stallard's article is repeatedly confirmed by the very fine case reports and photographs presented. The lessons of World War I which have been so thoroughly taught by John Martin Wheeler have been verified again in the field of plastic surgery.

The Doyne Lecture, "On Compression and Invasion of the Optic Nerves and Chiasma by Neighboring Gliomas," is of considerable historic interest in revealing the development and recognition of the syndrome which was first presented in an extended form by Foster Kennedy.

Many individual case reports are scattered through the transactions.

William M. James.

CORRESPONDENCE

GLAUCOMA FOLLOWING INGESTION OF SULFATHIAZOLE

Editor,
American Journal of Ophthalmology:

In the February, 1947, issue of the JOURNAL is an article by Fritz and Kesert reporting a case of glaucoma caused by sulfathiazole. The diagnosis of acute congestive glaucoma in the case reported is seriously questioned on the following counts:

1. The vision of either eye was corrected to normal by glasses.

2. The pupils were small and irregular.

3. The fundus was recorded as normal through undilated pupils.

4. The pupils, three days after the original acute attack, were normal in size and reacted briskly to light and accommodation despite the fact that eserine was being used in both eyes.

There is no doubt, from the case reported, that the patient was allergic to sulfathiazole. The edema of the lids and the chemosis, plus the intense itching and burning, were indicative of an allergic reaction. The incidental increase in pressure is not to be regarded as acute congestive glaucoma because the pupils were not dilated, the fundus could be seen, and the visual acuity was normal with glasses.

I think the authors have made a mistake. All acute inflammatory diseases bringing about edema and chemosis may be attended by increased pressure of the eyeball by purely a mechanical process. Acute iritis and acute anterior uveitis may be attended by increased intraocular pressure. These experiences which register a higher than normal tension on the tonometer are not to be regarded as acute congestive glaucoma.

(Signed) Louis Lehrfeld,
Philadelphia, Pennsylvania.

Editor,
American Journal of Ophthalmology:

Because of the difficulty in arranging a conference with Dr. Kesert, I will undertake to answer Dr. Lehrfeld's letter, assuming full responsibility therefore and not presuming, of course, to speak for Dr. Kesert, who might not subscribe fully to what I write.

Dr. Lehrfeld thinks that we were mistaken in our diagnosis. Indeed it is pos-

sible that we were. However, two well-known ophthalmologists, editors of the JOURNAL, saw the patient with us and agreed with the diagnosis and treatment.

Dr. Lehrfeld agrees that this attack of ocular disease was an allergic phenomenon. It certainly was acute. The turgid condition of the ciliary and conjunctival vessels made it appear congestive, and the increased tension relieved by eserine meant glaucoma as we are accustomed to think of the condition. We were struck by the good visual acuity, the small irregular pupils, and the clear corneas, but, because these findings were at variance with the classical picture of acute congestive glaucoma, we did not feel that the diagnosis was in doubt.

In classic, acute, congestive glaucoma, when promptly and successfully treated, a normal fundus has been recorded frequently. The pupillary reaction, as recorded on the third day after the original attack, we attributed to accidental omission of the prescribed therapy. We are aware of the glaucomas complicating anterior uveitis, and we like to believe that in two eyes as angrily red as this patient's were that the slitlamp and corneal microscope would have revealed a cell or two in the anterior chamber. This was not the case. We also believe that, instead of promptly relieving the condition, eserine would have made it much worse had a uveitis been present. Inflammatory diseases of the uveal tract may be attended by increased pressure of the eyeball by purely a mechanical process, as Dr. Lehrfeld said. In this case we believe that the mechanism was the same, but that the basic cause was not inflammatory but allergic in nature.

(Signed) Milo H. Fritz,
New York, New York.

ABSTRACT DEPARTMENT

EDITED BY DR. F. HERBERT HAESSLER

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is mentioned only in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy, embryology, and comparative ophthalmology

1

GENERAL METHODS OF DIAGNOSIS

Cristini, G. **The value and limits of color perimetry.** Rassegna Ital. d'Ottal., 1946, v. 15, Sept.-Oct., pp. 381-405.

For practical purposes, colored test targets are really useful only in the central fields. (13 figures.)

Eugene M. Blake.

Duguet, J. **Functional visual examination in aviation.** Ann. d'Ocul., 1946, v. 179, Sept., pp. 463-480.

The methods and instruments most frequently used in the visual examination of French and other aviators are briefly discussed. Visual acuity is preferably tested in France with the optometer of Beyne with illumination of 15 lux at a distance of 5 meters and the broken ring of Landolt. The oculomotor mechanism is preferably measured with the Maddox rod or the Remy diploscope. At the International Conference of Aviation in Montreal in 1946, the maximum adopted for pilots of civilian transports and military aviators were: esophoria, 10 degrees; exophoria, 5 degrees; hyperphoria, 1 degree. Binocular and stereoscopic vision is measured stereoscopically and with the Howard-Dollman apparatus, in which 30 mm. is the acceptable limit at 6 meters. Color vision is measured first with isochromatic charts and then with colored lanterns. Of isochromatic charts, the ninth edition of Ishihara published by Lewis in England in 1943 is considered satisfactory. The American edition published by the American Optical Company was found subject to a 25-percent error. Of the lanterns used, the chromeptre of Mehaute-Guerin and the lanterns of Green and Giles Archer were considered most satisfactory. Night vision may be satisfactorily tested with the AAF night vision tester (Eastman U.S.A.), Royal Air Force hexagon (Gr. Brit.), the method of Beyne and Worms (French), the Hecht-Schaler night vision tester (USA), or the adaptometer of Wilson (Gr. Brit.). (13 references.)

Chas. A. Bahn.

Paradoksov, L. F. **Correction in the localization of an intraocular foreign**

body in incorrect position of the eyeball during roentgenography. Vestnik Oft., 1945, v. 24, pts, 1-2, pp. 59-61.

Paradoksov gives tables for computing the error when the eyeball was deviating from the correct position during localizing roentgenography.

Ray K. Daily.

Pignalosa, G. **Red free ophthalmoscopy.** Riv. di Oftalm., 1946, v. 1, July-Aug., pp. 510-529.

The history, method, and clinical and physiological importance of red free ophthalmoscopy is comprehensively discussed. K. W. Ascher.

2

THERAPEUTICS AND OPERATIONS

Arentsen, Juan. **Infiltration of penicillin dissolved in 2-percent novocaine in localized bacterial inflammations.** El Día Médico (Buenos Aires), 1946, v. 18, Dec. 9, pp. 1950-1954.

The author advocates the infiltration of infected tissues with a solution of 3000 Oxford units of penicillin per c.c. of procaine solution. The penicillin is not applied on or in the infected wound but the surrounding inflammed tissue must be infiltrated. It can be applied in any stage of the evolution of infection. The treatment is painless, efficacious, and can be used in inflammations of the eye and its adnexa as safely as in other organs. F. H. Haessler.

Avgushevich, P. L. **Oxygen therapy in ocular war injuries.** Vestnik Oft., 1945, v. 24, pt. 4, pp. 28-31.

Subconjunctival oxygen insufflation is advocated for the absorption of traumatic corneal exudates, stimulating epithelization, and relieving subjective symptoms. It is also effective for stimulating the absorption of lens masses in the anterior chamber in traumatic cataract, and of fresh hemorrhages in the vitreous. The technic consists in insufflating oxygen subconjunctivally through a needle. Ray K. Daily.

Benstein, I. I. **The action of calcium iontophoresis on the specific sensitivity of eyes of tuberculous animals.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 13-17.

A laboratory investigation of calcium iontophoresis in ocular tuberculosis is reported. In experimental corneal tuberculosis it affects favorably the course of the tuberculous process and reduces the local sensitivity. The application of iontophoresis produces no irritating symptoms, and alleviates the inflammatory phenomena. The development of tuberculous granuloma is arrested. The lesion becomes sharply demarcated from healthy tissue and never reaches caseation. The effect of the iontophoresis on the Mantoux reaction is less marked than the local effect, but nevertheless manifests itself by a shift towards desensitization. The lowered sensitivity of the skin was present in animals infected directly in the eyeball, as well as in those infected hematogenously. Ray K. Daily.

Bursuk, G. G. **Substitutes for protein therapy and their choice in war-time.** Vestnik Oft., 1945, v. 24, pt. 3, pp. 32-35.

As criteria of effectiveness of an injection of a therapeutic agent Bursuk used his evaluation of the clinical improvement and a measurement of the sedimentation rate. He found that injections of milk, cod lever oil, 1-percent potassium permanganate solution, sulphur, 10-percent sodium chloride solution, sterilized egg yolk, hot air, and water were equally effective. He con-

cludes that the favorable effect is due not to the specific action of the injected agent on the inflammatory process, but to the action of some products which appear to be liberated in the tissues of the patient in response to the irritation produced by the injection.

Ray K. Daily.

Carmi, A. **Therapeutic action of cobra venom in ophthalmology.** Rassegna Ital. d'Ottal., 1946, v. 15, Sept.-Oct. pp. 437-439.

Carmi cites the advantages of snake venom in ocular therapeutics and quotes Calmette's extensive experiments with the poison of various classes of snakes. A weak solution of cobra venom instilled into the conjunctiva, has a sedative effect. Subcutaneously used it relieves the pain of neoplasms through vasodilation. The capillaries of the fundus undergo a similar dilation. It is thus useful in the optic nerve atrophy of arteriosclerosis and chorioretinitis. Other conditions said to be benefited by the venom are retrobulbar neuritis, retinal hemorrhages, myopic chorioretinitis, primary optic atrophy, and pigmentary degeneration of the retina. Eugene M. Blake.

Chentzov, A. G. **Tissue therapy data at the Eye Clinic of the First Moscow Medical Institute.** Vestnik Oft., 1946, v. 25, pt. 1, pp. 30-34.

This form of therapy was tried on 66 patients with myopic degeneration at the macula, retinal hemorrhages, vitreous opacities, retinal detachment, optic atrophy, uveitis, and keratitis. The results were encouraging, if not as good as those reported by Filatov; he ascribes the disparity in results to faults in technic. He regards tissue therapy as a new method of foreign protein therapy, with action different from that of lactotherapy. The effectiveness of mobilizing the resisting forces of an organism is generally recognized; biogenic stimulants bring additional strength to the regenerative powers of an organism attacked by disease. Ray K. Daily.

Cossu, D. **The use of Roentgen rays in the prevention of operative hemorrhage.** Rassegna Ital. d'Ottal., 1942, v. 11, March-April, p. 136.

For the prevention of operative hemorrhage and for the rapid absorption of extravasated blood, Cossu found X-ray treatment of the liver and spleen beneficial. It is indicated especially in operations where rubeosis iridis is a complication, or where one fears an intraocular hemorrhage. This treatment does not appear to be of value in severe trauma. Eugene M. Blake.

Fieandt, Olaf. **A case of transitory myopia following radium irradiation.** Acta Ophth., 1941, v. 19, pt. 1, pp. 11-14.

Following a post-operative irradiation of the right eyeball for a basal cell carcinoma, with 30 mg. of radium for four hours, a 29-year-old student developed a transitory myopia, which cleared up within ten days. He had, in addition, some conjunctival irritation, and small atrophic spots in the conjunctiva of the lids. The myopia is attributed to edema of the lens, and to a ciliary spasm. Ray K. Daily.

Filatov, V. P. **Methods of tissue therapy—biogenic stimulation.** Vestnik Oft. 1946, v. 25, pt. 1, pp. 3-9.

In the process of perfecting keratoplasty Filatov developed a new therapeutic procedure, that of tissue therapy. The idea found scientific support in the fact that in tissue cultures in vitro

the addition of a fresh piece of tissue stimulates the growth of the old pieces. In 1933 Filatov published his method for increasing the transparency of a corneal transplant with partial corneal transplantation adjacent to the transplant. He later discovered that tissue preserved on ice acted more effectively than fresh tissue. From experiments with various tissues the conclusion emerged that any human, animal or plant tissue under certain unfavorable conditions develops products which, when used therapeutically, exert a favorable nonspecific effect on the entire range of ocular diseases. Biogenic stimulants were also found effective in diseases of the skin, the joints, and the female genital organs. The investigations were extended into the sphere of biology and botany. The germination of seeds was hastened by soaking them in tissue extracts. The investigations of the nature of the biogenic stimulants showed that trauma to plants leads to the formation of traumatinic acid, which belongs to the dicarbon group and is a powerful stimulant to cell proliferation. This acid was extracted from plants and was subsequently synthetized. Such biologic activators also develop within a sick organism under the influence of unfavorable conditions; perhaps the favorable effect on some diseases of chemical substances, cold, hunger, and intercurrent diseases may be attributed to the same process. The development of biogenic stimulants within an organism requires great care. The introduction of prepared stimulants is safer, can be done with less trauma to the organism, and acts equally well on lues, tuberculosis and some other diseases. Biogenic stimulators raise the metabolism of the cell, stimulate its function, and probably increase the fermentation capacities of tissue albumens. This form of therapy is an adjuvant to other indicated therapeutic procedures, and should be used in conjunction with them.

The technic of tissue conservation and administration has changed with years of clinical experience. The newest form is that of implantation of autoclaved tissues and injections of their extracts. Detailed instructions are given for the preparation of extracts and their administration, and implantation of autoclaved cadaver skin, fresh organs, placenta, animal skin, and leaves of aloes. Ray K. Daily.

Foster, John. **Certain operations on the superior oblique.** Brit. Jour. Ophth., 1946, v. 30, Nov., pp. 676-682.

The relative rarity of direct operations on the superior oblique tendon impells the author to add three of his own. In the first a marked cyclophoria and vertical diplopia caused by traumatic paresis of the superior oblique were not relieved by tenotomy of the contralateral inferior rectus. By the method of Wheeler, the paretic muscle was advanced with a very good result. The second case was one of paresis of both the superior oblique and lateral rectus muscles of the same eye. At operation the internal rectus was recessed 6 mm., the outer halves of the superior and inferior recti were sutured to the insertion of the external rectus and the superior oblique was tucked 6 mm. Results were very satisfactory. In the third case traumatic adhesions around the inferior rectus could not be relieved by surgery. The superior oblique of the other eye was recessed 5 mm., with reasonably good results. (4 illustrations.) Morris Kaplan.

Gill, W. D. **An aid in facilitating postoperative dressing of the eye in**

patients with akinesis of lids. Arch. of Ophth., 1947, v. 37, Jan., pp. 82-83.

Several years ago the author called attention to a simple method of maintaining postoperative closure of the eyelids after akinesis of the orbicularis oculi muscle had been employed, which consisted in sealing the lashes of the upper lid to the lower lid by means of a small droplet of collodion. More recently, in order to facilitate opening the lids and breaking the collodion seal, a short length of silk suture is introduced beneath the lashes after the eyelids have been closed and sealed with collodion. This can be accomplished before the sealing, but in such instances particular care has to be exercised to avoid incorporating the silk suture in the collodion droplet. When this silk suture is in position, its ends are brought together and draped onto the cheek below the eyelid; the two ends are tied together and the customary dressing is applied. When the time comes to inspect the eye, it is a simple matter to grasp the ends of the silk suture and, with gentle traction, to separate the lids. R. W. Danielson.

Hughes, W. F. **Treatment of lewisite burns of the eye with dimercaprol ("BAL").** Arch. of Ophth., 1947, v. 37, Jan., pp. 25-41.

Exposure of the eye to relatively small quantities of liquid or vapor lewisite produces a devastating ocular lesion. The progressive nature of such a burn is caused by the arsenical component of this war gas. To free the tissues from arsenic after exposure to lewisite, English workers synthesized dimercaprol ("BAL"). The work here reported from the laboratories of the Wilmer Ophthalmological Institute was devoted to the determination of the optimum conditions for the use of this antidote, its mode of action and its limitations.

Lewisite is immediately hydrolyzed at the site of contact with the moist surface of the eye, liberating enough hydrochloric acid to produce a superficial corneal opacity. Within two to four minutes after exposure to lewisite followed by closure of the lids, all toxic arsenical material disappears from the surface of the cornea, and within two minutes the drug can be demonstrated in the aqueous. Beginning ten minutes after exposure and becoming well marked in thirty minutes, irreversible histologic changes in the cornea can be detected.

A single instillation of 5-percent dimercaprol solution or ointment within two to five minutes after exposure to lewisite effectively prevents the development of serious ocular lesions. This excellent therapeutic effect of dimercaprol is due, in part at least, to its rapid penetration and withdrawal of toxic arsenical material from the tissues before irreversible histologic changes have developed.

R. W. Danielson.

Iosefova, F. I. **Antireticular cytotoxic serum in the therapy of ocular tuberculosis.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 31-33.

A report of cases illustrates the effect of this remedy on the various types of metastatic ocular tuberculosis. It was found useful in chronic torpid keratitis profunda. It stimulates the physiologic function of connective tissue, and absorbtion and regression of the infiltration in the opaque cornea seems to follow. In patients with fresh chorioretinitis and periphlebitis is produces fresh hemorrhages and increased ret-

inal edema and should therefore be used with great caution.

Ray K. Daily.

Jona, Sergio. **Investigations concerning the action of three drugs of the adrenaline group (symphamine, sympathol, veritol) on the normal human eye.** Riv. Neuro-Oto-Oft., 1941, v. 18, no. 4, pp. 312-334.

The author administered the drugs named in rather high doses to study their influence on pupillary diameter, intraocular vascular pressure, caliber of the intraocular vessels, and ocular tension. Measurements were performed before oral, intramuscular, or intravenous administration and for one hour after, at five-minute intervals. The dosage of symphamine was 3 centigrams oral or intramuscular, of sympathol 6 centigrams were given intravenously of 30 centigrams intramuscularly, and of veritol 1 centigram intravenously, 2 centigrams intramuscularly, or 7.5 centigrams orally. Eight full-page tables illustrate the action on the normal human eye: there were but slight variations of both the pupillary diameter and the ocular tension. Other authors have reported marked effects when the same drugs were given by instillation and subconjunctival injection. The retinal arteries showed a very slight dilatation after symphamine administration, and a slight but inconstant constriction after sympathol and veritol. Symphamine produced a decrease of the intraocular arterial pressure which rose after administration of sympathol and of veritol.

K. W. Ascher.

Kenel, C. **Leeches and hirudine in ophthalmology.** Ann. d'Ocul., 1946, v. 179, May, pp. 296-305.

After a historical resumé of the uses of leeches in ophthalmology and general medicine, the chemical and other qualities of a deutero-albuminose, hirudine, which is prepared from the head of leeches, is described in detail. It inhibits blood coagulation, produces a basic increase of fibrinogen and globulins, is a local lymphagogue, is bactericidal and vasodilative. It is not toxic if given intravenously but does increase the toxicity of mercury. In iritis and vascular hypertension with eye or head pain the use of leeches or hirudine is followed by reduction of pain which is more rapid and complete than that which follows the use of artificial leeches. Leeches infected with anthrax did not communicate the disease to experimental animals. The relief of a pain following the use of leeches is apparently due to their indirect action on the cerebrospinal fluid. Three applications of two leeches are used over the mastoid region at 36 to 48-hour intervals. In Switzerland the use of leeches has greatly increased during the past ten years, and more than 300,000 leeches were used in France during 1944. Hypertension in glaucoma is lowered and pain is greatly reduced after the use of leeches. Liquimine and dicouramine are not considered as effective as hirudine.

Chas. A. Bahn.

Kirby, D. B. **Emergency ophthalmic surgery.** New York State J. Med., 1947, v. 47, Jan., pp. 143-150.

The author discusses the conditions in which an emergency enucleation of the globe is indicated, indications for implantation into Tenon's capsule, emergency problems as are found in congenital, infantile, and adult glaucoma, central venous thrombosis, injuries and magnetic and nonmagnetic

foreign bodies within the eye and orbit; sympathetic ophthalmia, traumatic cataract and dislocated crystalline lens, emergency surgery of the lids and adnexa, neuroparalytic keratitis, keratitis with lagophthalmus, and expanding lesions in the orbit.

Bennett W. Muir

Klein, M. **Surgical anatomy of the facial nerve. With reference to the technique of orbicularis block (palpebral akinesia).** Brit. Jour. Ophth., 1946, v. 30, Nov., pp. 668-675.

Klein describes the methods of akinesia as suggested by Van Lint and by O'Brien and decides that the chance of error with each is too great. By anatomical dissection he demonstrates that the main bifurcation of the trunk of the facial nerve is quite below the area used so that both methods can easily miss many of the fibers. It is suggested that the correct point for injection is the area below the condyloid process at the junction of the upper and middle third of the distance between the zygomatic arch and the angle of the mandible. (4 figures.)

Morris Kaplan.

Krasnov, M. L. **The use of tecodine in ophthalmology.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 35-36.

The authors comments favorably on the use of tecodine, which is dihydroxydionin chlorhydrate, as a substitute for morphine. In ophthalmology it can be used as an analgesic and as a basal anesthetic in conjunction with local anesthesia. It is free from some of the disagreeable effects of morphine, and is much less habit forming.

Ray K. Daily.

Larsson, Sven. **Surgical bone-free roentgenography of the eyeball.** Acta Ophth., 1941, v. 19, pt. 1, pp. 1-10.

This method is similar to the one proposed by Franceschetti in 1934. The medial surface of the eyeball is exposed through a conjunctival incision, and the rectus internus is separated from the eyeball, the film applied to the surface of the eyeball as far back as the posterior pole, and the X rays directed from the temporal side. For exact localization of nonmagnetic foreign bodies, the film is applied as close to the suspected site of the foreign body as possible, and two exposures are taken. As an indicator the author uses a fine needle point introduced into the episclera. If the X-ray film shows that the foreign body is located at a distance from the indicator, the indicator is removed, reintroduced at another spot, and another X-ray picture taken; this is repeated until the indicator is found to lie exactly over the foreign body. In this fashion the author succeeded in extracting two nonmagnetic foreign bodies from eyes with opaque lenses. This method of localization is particularly suitable for fine nonmagnetic splinters that lie close to the posterior pole. (4 illustrations.)

Ray K. Daily.

Mata, Pedro. **Vitamin P in ophthalmology.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1256-1265.

Mata reviews the known data on vitamine P and advocates its use as an antihemorrhagic agent. He found it very effective in preventing postoperative hemorrhage after dacryocystorhinostomies, and because of its effect on capillary permeability it exerts a favorable effect in the various types of iritis.

Ray K. Daily.

O'Brien, C. S. **Ocular surgery.** Arch. of Ophth., 1947, v. 37, Jan., pp. 1-7.

No excuse exists for poor anesthesia.

An apprehensive and uncooperative patient is not conducive to good surgical performance. Preoperative sedation is indicated in all patients. Paralysis of the muscles of lid closure is indicated in any operation in which the globe is opened. O'Brien injects typhoid H antigen vaccine intravenously, in a dose of 10,000,000 to 15,000,000 bacilli, two days before cataract extraction and in a dose of 15,000,000 to 20,000,000 on the next day. A slightly modified Stallard suture is satisfactory. The keratome and scissors incision is much more easily made and is safer than the full Graefe knife incision, although it is less spectacular. Air injected into the anterior chamber keeps the angle open. One eye only need have a dressing. The patient may be allowed to sit in a chair or lie in bed, as desired.

In cataract combined with primary glaucoma the author uses a combined anterior sclerectomy (Lagrange) and cataract extraction. In acute narrow angle glaucoma a basal iridectomy is indicated. In chronic wide or narrow angle glaucoma, in which the tension is not too greatly elevated, in eyes with small visual fields, or as a second operation, cyclodialysis is good practice.

It seems wise to do a two-stage operation in cases of convergent strabismus, for with this method there are few overcorrections. Undercorrection is expected after the first operation. In most cases of convergent strabismus of over 15 degrees a recession of 5 mm. is made on one internal rectus muscle. After three or more months the lateral rectus is shortened, or shortened and advanced, depending on the amount of deviation that remains. In recession a muscle clamp is never used, since 2 to 3 mm. of muscle is lost. Only a squint hook is used, and the sutures are placed as close to the insertion of the muscle as possible. The muscle sheath is always kept intact.

For tumors of the orbit, a wide lateral canthotomy, extending about one centimeter back from the bony orbital margin, is made, and the incision is extended upward or downward in the conjunctival fornix.

R. W. Danielson.

Paltzeva, T. A. **Subconjunctival injections of laked blood in the treatment of corneal diseases.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 34-36.

Three drops of the patient's blood are added to one half c.c. of distilled water and when the blood is hemolyzed 0.2 c.c. of the mixture is injected subconjunctivally close to the limbus. The tabulated data show that the treatment has no objectionable features, that it ameliorates discomfort, and stimulates epithelization, vascularization, and absorption of hypopyon. It is effective in superficial herpetic keratitis, and mild corneal ulcers. The general reaction to this treatment consists in an increased number of leucocytes and erythrocytes.

Ray K. Daily.

Piatigorsky, I. V. and Ulskaja, L. D. **Ultraviolet erythema in the treatment of traumatic iridocyclitis.** Vestnik Oft. 1946, v. 25, pt. 4, pp. 33-34.

In 30 cases of torpid traumatic iridocyclitis, the value of this form of physiotherapy was demonstrated statistically.

Ray K. Daily.

Post, M. H., Jr. **Dust-borne infection in ophthalmic surgery.** Trans. Amer. Ophth. Soc., 1945, v. 43, pp. 79-97.

The author presents ample bacteriologic evidence of gross contamination of operating fields, solutions, and instruments during the course of routine ophthalmic surgery. His experiments

indicate that 1 to 3,000 zephiran solution is an effective inhibitor of bacterial metabolism and should be substituted for the water bath in which sterile instruments are rinsed. All solutions, towels, and instruments should be kept covered. Instruments that are to enter the eyeball should be dipped into a suitable sterilizing solution or boiling water for at least two and one half seconds immediately before use. Blankets and sheets should be treated with a preparation of an oil and a preparation should be used on the floor to allay the dust. Equipment for sterilization of air is now available and should be installed in operating rooms as soon as possible. C. D. F. Jensen.

Samoilov, A. J. **The mechanism of action of calcium iontophoresis on the eye.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 45-50.

After administering calcium iontophoresis through the lids, through the cornea, and over the skin of the shoulder, Samoilov concludes that calcium acts directly on the tissues of the eye, and not reflexly through the receptors of the skin. The criterion for the action of calcium was diminution of an enlarged blind spot or scotoma following the procedure. While chemically no increase in the calcium content of the eye can be demonstrated, Samoilov believes that the biologic evidence is adequate to prove the direct action of calcium on the edematous ocular tissue. (2 tables.)

Ray K. Daily.

Senâ, J. A. **Gonioscopy. Introduction to its study.** Arch. de Oft. de Buenos Aires, 1946, v. 21, Jan.-March, p. 1.

The author discusses the different techniques for the clinical examination of the angle of the anterior chamber, and describes the normal histology of this region in man. He follows Uribe Troncoso's and Castroviejo's procedures, using the slit lamp and the corneal microscope. The structures of the angle are illustrated in colored drawings and photomicrographs, as well as actual photographs taken with the gonioscope. (Bibliography).

Plinio Montalván.

Shatilova, T. A. **Treatment of ocular tuberculosis with anatuberculin.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 28-31.

Anatuberculin is an albumin-free preparation manufactured in Leningrad, which Shatilova finds free from the toxicity of old tuberculin. It has no contraindications, and in severe forms should be used in conjunction with general and local therapy.

Ray K. Daily.

Sysi, R. **Molluscum contagiosum of the cornea.** Acta Ophth., 1941, v. 19, pt. 1, pp. 25-27.

The author believes that he is reporting the first case of molluscum contagiosum of the cornea. The three-year-old boy had two nodules on the border of the left lower lid and one in the center of the right cornea. The microscopic examination and the clinical course verified the diagnosis.

Ray K. Daily.

3

PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Aquilar Munoz, Jose. **The use of Remy's diploscope in refraction.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Sept., pp. 878-900.

Since 1940 the author routinely uses Remy's diploscope. It is a simple apparatus and easy to use. It should be used preferably for hypermetropia and

patients with imperfect or absolute faults of binocular vision, and for the diagnosis and treatment of the heterophorias, especially the exophorias. By using this instrument the prescription of prisms becomes more accurate.

J. Wesley McKinney.

v. Bahr, Gunnar. **Investigations into the spherical and chromatic aberration of the eye, and their influence on refraction.** Acta Ophth., 1945, v. 23, pt. 1, pp. 1-47.

The literature is briefly reviewed, and the author's investigation, using an aberrometer constructed on Scheiner's principle, is reported in detail. The investigation was made in two series: in one, 32 medical students and doctors were tested with red and blue rays, transmitted through a cobalt filter; in the second series, 25 subjects were examined with monochromatic light from a monochromator. The data furnished by these tests were then compared with data derived from refractions, according to Donders, using the same monochromatic illumination on test charts. The tabulated data show that there is, as a rule, positive aberration in the whole of the pupillary field, but that it varies considerably in strength; not infrequently, the aberration is negative, and sometimes it is positive in the central part of the field, and negative in the peripheral part. When the vision is clearest, neither the cusp of the caustic surface nor the narrowest cross section of the refracted pencil of rays is placed on the retina; a cross-section of the caustic surface is situated on the retina, which is nearer to the refracting system than the cusp, when there is positive aberration, and further away when the aberration is negative. The data also show that the total astigmatism as found in the customary refraction tests depends not only on the distance between the points where the paraxial rays intersect in the principal sections, but also on the aberration of the astigmatism. The table of chromatic aberration shows that there is no significant difference between the chromatic aberrations in the different peripheral parts of the optic system, and that in monochromatic illumination the wave length of the light affects refraction considerably. The visual acuity in pure blue light is decidedly lower than in red and green light. (3 figures, 9 tables.)

Louis Daily, Jr.

Burian, H. M. **Sensorial retinal relationship in concomitant strabismus.** Arch. of Ophth., 1947, v. 37, March, pp. 336-368.

The author describes and analyzes in great detail the sensorial-retinal relationship in concommitant strabismus. The analysis will be continued in a future issue of the Archives.

R. W. Danielson.

Hallett, J. W. **Unexplained amblyopia as a military problem.** Military Surg., 1946, v. 99, Aug., pp. 110-116.

These studies of bilateral as well as unilateral visual defects included only patients with no visible abnormalities in the eye. Obviously those with strabismus and anisometropia were not included. Malingering, an important feature of the investigation, was determined by the visual angle test. The vision, in the patients studied, was not better than 20/40.

Fifty-one cases were reported, thirty of bilateral amblyopia. Half of the patients with bilateral defects gave positive malingering tests but only two who had unilateral amblyopia malingered. Almost 75 percent of the patients had visual field defects such as tubular

fields, interlacing of color fields, and concentric contraction. Malingerers with bilateral amblyopia were considered as potential psychiatric problems. Tubular fields were associated with functional nervous disorders in a high percentage of cases.

Francis M. Crage.

Hardy, L. H., Rand, G., and Rittler, M. C. **Effect of quality of illumination on the results of the Ishihara test.** Arch. of Ophth., 1946, v. 36, Dec., pp. 685-699.

Color vision determinations were made on 22 subjects employing various editions of the Ishihara test under standard daylight illumination and also with tungsten filament illumination. The daylight was provided by a Macbeth daylight lamp designed to operate at approximately 6,750° K. The tungsten filament illumination had a color temperature of approximately 2,848° K. When tungsten light is used as the illuminant, the performance scores attained by all of the deuteranomalous and deuteranopic subjects tested are higher than when daylight is used. The responses of protanopic and protanomalous subjects are little affected by this change. A substantial number of deuteranomalous subjects are sufficiently aided in giving normal responses by the incorrect use of tungsten light that they may be erroneously classified as normal. There is a decrease in the number of subjects who are correctly classified as to type of defective red-green vision when tested under tungsten light, as compared with the number so classified when tested under daylight, and an increase in the number of protanomalous and protanopic subjects who are incorrectly classified.

The authors stress the critical importance of strict observance of correct conditions of illumination during the administration of polychromatic tests which employ test material seen by reflected light. John C. Long.

Litinsky, G. A. **Training of depth perception in the one-eyed.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 11-15.

Litinski holds that monocular depth perception is possible if the observer can see the extent of the surface on which the objects are placed; with the surface invisible monocular depth judgment becomes 10 to 20 times poorer than binocular. Binocular depth perception is equally good with or without visibility of the surface. Litinsky agrees with Helmholtz that depth perception is an acquired function and believes that monocular perception can be acquired by training. On the basis of experience with 28 patients, Litinsky concludes that depth perception lost with the loss of one eye can be restored by training, and that best results in training are obtained in people with normal visual acuity. Training is most effective when exercises are done with objects that cannot be related to a visible surface such as ball playing, tennis, ping-pong, volley ball, and basket ball. The period of training requires not less than 10 to 15 days and 15-20 minutes daily. The vocational importance of depth perception justifies the establishment of training facilities in military and civilian hospitals.

Ray K. Daily.

Ludvigh, Elek. **Bench for the teaching of ophthalmic optics.** Arch. of Ophth., 1947, v. 37, March, pp. 383-385.

The optical bench is an essential adjunct to laboratory instruction in elementary ophthalmic optics. The benches ordinarily employed are not designed for the teaching of ophthalmic

optics and have many features which are undesirable for that purpose. Ludvigh points out the difficulties experienced with the optical benches commonly available, and states how these are overcome in the bench here described. R. W. Danielson.

Moore, R. F. **Subjective "lightning streaks."** Brit. Jour. Ophth., 1947, v. 31, Jan., pp. 46-50.

Three oculists describe their subjective experiences with "lightning streaks." These streaks apparently occur after middle age, most usually in myopic eyes and perhaps more commonly in women. Sudden flashes of light occur along with the simultaneous appearance of spots before the eyes. They are very bright, occur in the outer fields mostly and move from above downward. They start in one eye but tend to become bilateral. They are associated with quick movements of the eyes and thus can be elicited at will. They are best seen at night and the eyes may be open or closed. Verhoeff, one of the subjects, attributes them to a shrinking and partial separation of the vitreous which then impinges on the retina and induces the stimulation. Morris Kaplan.

Valerio, Mario. **Jackson's cross cylinder in the determination of the axis of astigmatism.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 241-263.

Valerio reviews the history of the bicylindric lenses from the time of Stokes, in 1849, until its perfection by Jackson. The author considers the correct name to be bicylinders, rather than cross cylinders. In spite of its wide use in the United States the instrument is little known abroad. The author soon found the cross cylinder "absolutely indespensable for an accurate examination of the refraction" and proceeds to give a complete explanation of its construction and application, with illustrative cases and photographs. (4 figures.) Eugene M. Blake.

Walker, J. P. S. **Myopia and pseudomyopia.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp 735-742.

Walker points out that many cases of pseudomyopia are missed in routine practice. It occurs mostly in the young, but it can occur at any age. As a safeguard the author suggests that all patients under 16 years of age be refracted after atropine has been instilled twice daily for three days. In some cases it should be instilled for two weeks before examination. The term pseudomyopia includes spasm of accommodation. Ten reports are presented of cases in which the patient seemed to desire more minus power than the refraction indicated; these were considered as due to spasms and were treated with atropine or orthoptic training or both with very good results. The fact is emphasized that pseudomyopia is just as likely to occur in the hyperopic and emmetropic patients as in myopic ones. Morris Kaplan.

Weekers, R., and Roussel, F. **Introduction to study of the critical flicker frequency for clinical purposes.** Ophthalmologica, 1946, v. 112, Dec., pp. 305-319.

Critical flicker frequency or fusion frequency of flicker is the smallest number of periodic changes from light to dark per second which abolishes the subjective sensation of flicker. The authors have constructed an apparatus for the determination of the critical flicker frequency of circumscribed, central or peripheral retinal areas and have found parallelism, in diseased eyes, be-

tween the results of quantitative perimetry and the critical flicker frequency. Peter C. Kronfeld.

4

OCULAR MOVEMENTS

Adler, Francis H. **Physiologic factors in differential diagnosis of paralysis of superior rectus and superior oblique muscles.** Arch. of Ophth., 1946, v. 36, Dec., pp. 661-673.

In cases of primary or congenital paralysis of a vertically acting muscle a differential diagnosis between paralysis of the superior oblique of one side and the superior rectus of the opposite side may be made on the basis of the following signs: Tilting the head is the most characteristic sign of paralysis of the superior oblique muscle. Tilting does occur with paralysis of the superior rectus, but is slight. The head is always tilted toward the side opposite the paralyzed eye. If the head is tilted by the examiner on the shoulder of the same side as the paralyzed eye, this eye will make an upward movement if the superior oblique is paralyzed. If the superior rectus is paralyzed, the eye either will not move at all or will move slightly downward.

A factor which may confuse the picture in primary or secondary paralysis of a vertically acting muscle is the occurrence of inhibitional palsy of the contralateral antagonist. When this is present, primary paralysis of the superior oblique may easily be mistaken for paralysis of the superior rectus. The physiologic bases for the various signs are discussed in some detail.

John C. Long.

Azzolini, Umberto. **Synkinesis between the levator palpebrae superioris and the musculus zygomaticus.** Riv. Oto-Neuro-Oft., 1942, v. 19, Nov.-Dec., pp. 382-397.

An otherwise normal girl, eight years of age, had an almost complete left ptosis; the upper lid could not be elevated by any of the synkinetic innervations except in smiling. The homolateral zygomatic muscle is innervated by the seventh cranial nerve. The author assumes that there was a congenital heterotopic location of the nucleus of the levator palpebrae superioris, the cells of which were displaced into the neighborhood of the nucleus of the facial nerve. (4 figures.)

K. W. Ascher.

Cass, E. **Strabismus.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 126-160.

The author presents a detailed review of the literature concerning strabismus, especially from the etiological standpoint. (10 illustrations.)

J. Wesley McKinney.

Del Barrio, Alejandro. **Development and treatment of squint.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Sept., pp. 863-877.

The author agrees that the key to the development of squint is in the binocular vision, which if it develops normally produces no squint, even if there are other disposing causes. On the other hand, if this function is incomplete, a small alteration of the optic apparatus, sensorial or motor, is able to produce squint. It is thus that surgical as well as functional treatment is directed toward normalizing the binocular vision. J. Wesley McKinney.

Della Vedova, Ausano. **Laryngo-vestibular signs in syringobulbia.** Riv. Oto-Neuro-Oft., 1943, v. 20, Jan.-Feb., pp. 29-39.

In three patients suffering from syringobulbia, spontaneous nystagmus was associated with laryngeal paresis. In two of them, the nystagmus was rotatory, counterclockwise, and associated with a right abduction paralysis of the larynx; in the third the laryngeal paresis was bilateral, and the nystagmus horizontal. This syndrome is of diagnostic significance in early stages of syringobulbia. K. W. Ascher.

Epstein, G. J. **Congenital vertical motor pareses.** Arch. of Ophth., 1947, v. 37, March, pp. 369-374.

After discussion of the literature and a review of pertinent embryology, the authors conclude that congenital pareses of the extrinsic ocular muscles are due to errors in cleavage of the common premuscle mass, aplasia of the primitive head cavities and aplasia of the connections in the central nervous system. Of these, pareses of the first type are by far the most common.

Errors in cleavage are most likely to affect those muscles which are differentiated late in embryonic development. Therefore, of the vertical muscles, the superior rectus is by far the most commonly affected, the inferior rectus and the inferior oblique next and the superior oblique most infrequently. There is clinical evidence to support this view.
R. W. Danielson.

Ferrara, Aristide. **A case of Parinaud's paralysis.** Riv. Oto-Neuro-Oft., 1942, v. 19, July-Aug., pp. 277-288.

Two years before admission, a 40-year-old farmer had become unconscious and had suffered a paralysis of his left arm, and diplopia. Corrected vision was 10/10 and 7/10 respectively; the visual fields were normal. Ophthalmoscopy revealed no pathologic changes. The eyeballs could be rotated neither up nor down, and no convergence was possible; touching of the corneas produced contraction of the orbicularis but no flight movement of the bulbi. Compensatory eye movements were absent. The Wassermann reaction in the cerebrospinal fluid was positive. A luetic arteritis of the cerebral arteries was assumed and a juxtaventricular hemorrhage seemed to be responsible for the lesion involving the nuclei that govern the associated eye movements.
K. W. Ascher.

Ferreira Filho, J. **Pseudo-Graefe phenomenon.** Arch. of Ophth., 1947, v. 37, March, pp. 308-317.

The author reviews the literature and reports a case of his own.
R. W. Danielson.

Fisher, E. M. **The practical significance of the voluntary convergence.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 10-11.

Whereas the role of the accommodation-convergence relationship in the pathogenesis of convergent strabismus is well understood, its role in straightening the visual axes in divergent strabismus is sometimes overlooked. In the effort to obtain parellelism of divergent eyes the exercise of convergence produces a spurious myopia, the nature of which can be established by skiascopic examination under atropine, and which should not be corrected with glasses. Ray K. Daily.

Fisher, E. M. **Errors in the conservative treatment of strabismus.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 6-9.

Listed as errors in the pattern of therapy of concomitant strabismus are improper selection of patients for delayed treatment, failure to prescribe the full correction, neglect to treat amblyopia, or to treat it inadequately, inade-

quate preparation for orthoptic training by preliminary refraction, the training of binocular vision in the presence of abnormal correspondence, and orthoptic training in the presence of a large angle of deviation of the visual axes. Ray K. Daily.

Krewson, William E., III. **Surgical methods of treating paralysis of the superior oblique muscle.** Arch. of Ophth., 1947, v. 37, Feb., pp. 121-133.

No one standard sequence of corrective measures can be advocated for all patients. The plan of attack must be based on the measurements in the individual case. If a choice is permitted, weakening of a depressor muscle is undesirable; strengthening of a depressor or weakening of an elevator muscle is preferable, for there is greater need for binocular vision in the lower than in the upper parts of the fields. If there is marked overaction of the homolateral, antagonistic inferior oblique muscle, tenotomy of this muscle is probably desirable as the initial operation. In the usual case of paralysis of the superior oblique muscle most surgeons apparently first do a recession of the contralateral inferior rectus and then attempt a shortening of the paralytic superior oblique. Depending on measurements then obtained, these operations are supplemented by recession of the homolateral, overacting inferior oblique, advancement of the contralateral superior rectus or advancement of the homolateral inferior rectus. In cases of bilateral paralysis of the superior oblique, equalization and preservation of the remaining depressors are advisable. John C. Long.

Lewis, M. M. **An investigation of "normal" on the synoptophore.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp. 749-757.

An interesting statistical study on 100 young subjects who had no ocular complaints is presented. The study was performed to determine a normal for synoptophore measurements and to compare these with Maddox rod measurements. The subjects were tested for binocular vision, fusion, abduction and adduction and the data are tabulated. There was some correlation between Maddox rod readings and those of the synoptophore though the latter readings were generally more exophoric and spread over a wider range.

Morris Kaplan.

Lopez-Dominguez, B. **A classification of strabismus and its therapeutic implications.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1277-1283.

The proposed classification is based on disturbances of the function of each of the participating entities of the reflex act of seeing, namely, the organ of perception, the centripetal pathway, the center, the centrifugal pathway, and the motor apparatus. Refractive strabismus, which is divided into isometropic and anisometropic, may be caused by a disturbance in the eye itself and may be central in origin. The instability of the surgical results is attributed to the fact that frequently the surgical procedure has no relation to the etiologic factor, and it is pointed out that the prognosis is best in cases in which the deviation is due to refractive or muscular anomalies, amenable to direct correction. Ray K. Daily.

Matteucci, P. **Congenital defects of abduction.** Rassegna Ital. d'Ottal., 1946, v. 15, Sept.-Oct., pp. 345-380.

Deficiency or congenital absence of abduction is frequently associated with numerous other defects, especially with

paralysis of the third and seventh cranial nerves. At times malformations of the eyes, the face, the trunk or the extremities, and retraction of the globe are noted. Among 60 cases collected from the literature other disturbances of motility than defects of abduction were found 25 times, anomalies or malformations were reported 14 times, and retraction of the globe 23 times. Three cases are added by the author, and a histologic study made of one of them is given in detail. The literature is extensively reviewed. (2 tables, 6 figures.)

Eugene M. Blake.

Milletti, Mario. **Contribution to the knowledge of multiple aneurisms of cerebral vessels.** Riv. Oto-Neuro-Oft., 1946, v. 21, May-Aug., pp. 141-152.

A woman, 54 years of age, had recurrent attacks of pain of the left eyeball and the region about it for about a year. She had complete left oculomotor paralysis, and a slight right hemiparesis. Cerebral arteriography showed a diffuse cerebral arteriosclerosis, a big aneurysmal enlargement of the left internal carotid artery and a smaller aneurysmal sac of the posterior communicating artery above the posterior clinoid. In his discussion the writer states that the paralytic symptoms were due to compression of the trunk of the third nerve by the posterior aneurysm, and the hemiparesis to the compression of the pes pedunculi. The writer calls this symptomatology a "syndrome of the aneurysm of the pes pedunculi region." (Bibliography and 2 figures.)

Melchiore Lombardo.

Ogle, K. N., and Ellerbrock, V. J. **Cyclofusional movements.** Arch. of Ophth., 1946, v. 36, Dec., pp. 700-735.

There is now agreement that the external muscles of the eyes can, in the interest of maintaining binocular single vision, cooperate to provide cyclotorsions about the visual axes, which themselves may remain fixed. These movements have been designated as psychoöptical reflex movements.

The authors discuss experiments utilizing stereoscopic methods of spatial localization, which show that these cyclofusional movements occur much more freely than was heretofore realized. In the main these movements take place with any change in the type and orientation of configurations in the visual field.

A satistical study of the data obtained from 400 subjects with astigmatism at oblique axes is presented. The results suggest that the eyes of these subjects maintain cyclotorsional positions that partially correct the declinations of the images which, in turn, arise from the meridional magnifications accompanying the correction of the astigmatic errors.

The correlation found emphasizes the stability of the organization between the retinal elements of the two eyes.

John C. Long

Rogers, Lambert. **A curious reflex movement of the upper eyelid in oculomotor palsy.** J. Royal Naval Med. Service, 1946, v. 32, Oct., pp. 270-272.

The author describes a case of ptosis of the right upper eyelid following an intracranial aneurysm. When the left eye is turned outward, the ptosed right upper lid opens; as the left eye continues outward, the right upper lid continues to open until the left eye is maximally abducted and there is almost complete opening of the right eye. The lid movement is reflex and involuntary. (4 figures.)

Irwin E. Gaynon.

Scobee, R. G., and Green, E. L. **Tests for heterophoria.** Amer. Jour. Ophth.,

1947, v. 30, April, pp. 436-451. (8 tables, 9 references.)

Sergievsky, L. I. **Invisible strabismus, and the character of vision with both eyes open.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 4-5.

This is an analysis of 983 cases of strabismus; 62 cases with no deviation of the visual axis and no binocular vision are designated as invisible strabismus. Among 102 patients with periodic strabismus, vision not lower than 0.5 in the poorer eye was found in 23, binocular vision was present in 16, and simultaneous macular perception was present in 20 patients, of whom 10 had good vision. Of 98 patients in whom the visible strabismus became invisible, 42 developed binocular vision, 51 had monocular vision, and 5 had simultaneous perception. The data thus show that deviation of the visual axes may disappear with age, but the absence of binocular vision remains; the time required for parallellism of the visual axis to develop with glasses is 1 to 18 months; in half of the patients it was two to four months. With orthoptic treatment patients with monocular vision develop simultaneous macular perception in 12 to 14 days, but it may take 11 months; simultaneous perception develops into binocular vision in four to 10 months. When the deviation did not disappear under atropine, but did clear up after wearing of glasses, it required two months to develop simultaneous perception, and one to three months longer for the development of binocular vision. Ray K. Daily.

Sergievsky, L. I., and Bilit, M. V. **The effect of prolonged atropinization on the refraction and on the angle of deviation in concomitant strabismus.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 15-17.

An analysis of their case histories shows that the attainment of complete paralysis of accommodation requires at least ten days of atropinization, and that failure of the visual axes to become parallel even after atropinization for ten days is not conclusive evidence that the wearing of glasses will fail to straighten the eyes. Atropine is apt to correct deviations of 20 degrees. An interesting feature is exhibited by two hypermetropic patients in whom atropinization produced no change in the refractive correction, but relieved a deviation of the visual axes of 20 and 10 degrees respectively. Among those in whom the eyes became straight are some in which the deviating eyes had a visual acuity of .01. There was obviously no stimulus for accommodation in such eyes; the important factor in the deviation and the straightening of the visual axes seems to be the accommodation of the fixating eye.

Ray K. Daily.

Strich, A. J. **Classification of strabismus.** Illinois Med. J., 1946, v. 89, Jan., pp. 25-28.

The author classifies strabismus, on an etiologic basis, as anatomic and innervational. In the former a lesion in the motor apparatus of the eye can be demonstrated, and in the latter, no lesion in the motor apparatus can be proved, although there may be a lesion of the visual apparatus, or a disease of the central nervous system. The anatomic cause may be a difference in shape of the two orbits, a congenital or acquired abnormality of the external ocular muscles or injuries to the peripheral neuron of the third, fourth, and sixth cranial nerves (as in diph-

theria, Gradenigo's syndrome, lues, tuberculosis, and meningitis). Nuclear strabismus is caused by congenital aplasia, hemorrhage, infections, diabetes, and poisoning of the nucleus of the nerves, and supranuclear strabismus can be caused by encephalitis lethargica, multiple sclerosis, small hemorrhages, and tumors that involve supranuclear pathways. A discussion of the diagnosis of supranuclear lesions follows. Corpus striatum strabismus is usually caused by postencephalitic Parkinson's disease, paralysis agitans, or Wilson's disease.

Innervational factors frequently complicate anatomic strabismus or may be the only cause as in the Donder's type in which an excessive hyperopia brings about excessive accommodation. Convergent squint associated with congenital myopia is probably due to a conditioned reflex. Inasmuch as the patient can see objects only when held very close, he develops an association between vision and excessive convergence. Poor-vision squints develop exotropia if the poor vision is present at birth, esotropia if it comes on during the period of flux. Pseudoparalytic strabismus is an alternating convergent strabismus, simulating bilateral abducens paralysis. The patient alternately uses his left eye to see the right part of the field, and his right eye to see the left part, and thus never has use of the external rectus muscles. Associated vertical divergence is caused by intermittent excitations of the vertical divergence center. Overaction of the inferior obliques is synkinetic in origin. Excessive stimuli to the convergence center overflow to the adjacent center for action of the inferior obliques, thus causing unilateral or bilateral primary inferior oblique spasms. Most strabismus has a combination of anatomic causes and innervational factors.

John B. Hitz.

Tassman, I. S. **Complete unilateral ophthalmoplegia due to primary carcinoma of the spenoidal sinus.** Arch of Ophth., 1946, v. 37, March, pp. 294-303.

A neoplastic, inflammatory, or traumatic process which involves the structures passing through the sphenoidal (superior orbital) fissure and the optic canal may result in pressure on these structures and cause an ophthalmoplegia. The condition has been described in the literature as the "orbital apex-sphenoid fissure syndrome." About 10 cases of the syndrome have been reported in the American literature since 1900.

Carcinoma of the sphenoidal sinus has five routes of extension. In order of frequency, these are: orbital, nasal, cranial, petrous and occipital.

An interesting case of the complete syndrome is reported which was due to lateral extension of a malignant process from the sphenoidal sinus that involved the structures which leave the adjacent cavernous sinus and enter the sphenoidal fissure and the optic canal.

Epistaxis was unusually severe and prominent. Together with headache, it was an initial symptom. Severe, sharp, knifelike pains radiated over the forehead, the right temple and both eyebrows, and were more severe over the right side. There was also a burning sensation of the scalp.

The ophthalmoplegia came on rather quickly. It was complete within six days after appearance of the first ocular signs. In most of the cases in which the syndrome is due to a malignant growth, the symptoms have a much

slower onset and are more gradual in their progress.

Since this case was reported, the author has had the opportunity to study two others. R. W. Danielson.

5

CONJUNCTIVA

Abkina, D. A., and Normark, I. P. **Conjunctival erythema in typhus.** Vestnik Oft., 1945, v. 25, pt. 4, pp. 45-46.

Bluish-red oval spots in the conjunctiva about 2 mm. in size are diagnostic of typhus fever; they may precede the rash, and persist after the rash has disappeared. Microscopically these spots show a stasis in the arteriocapillary network immediately under the epithelium, proliferative perivasculitis, and hemorrhages. Among 45 patients with typhus 12 had conjunctival erythema. Ray K. Daily.

Arcuri, Domenico. **Conjunctival naevi.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 264-289.

The author asserts that the majority of malignant epibulbar tumors arise from naevi, and stresses the importance of biomicroscopic study of all such cases. By this method the delicate changes of initial malignant degeneration can be detected. The histologic changes are described and the disputed question whether they arise from epithelial or connective tissues is considered. Ascuri reports two cases and found it impossible to determine their origin microscopically. Every naevus which shows a tendency to increase in size should be excised and the removal followed by diathermy coagulation. (6 figures.) Eugene M. Blake.

Bruce, G. M., and Locatcher-Khorazo, D. **Primary tuberculosis of the conjunctiva.** Arch. of Ophth., 1947, v. 37, March, pp. 375-378.

A case of primary tuberculosis of the conjunctiva with involvement of the adjacent lymph nodes in a 9-year-old child is reported. Systemic extension did not take place, and the patient recovered under conservative treatment. R. W. Danielson.

Chulia, Vincennte. **Actinic keratoconjunctivitis.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1253-1254.

A case of actinic keratoconjunctivitis in a 15 year old girl, with pale, fine skin, and red hair, is reported, and it is pointed out that a constitutional predisposition is an essential factor for the development of this disease. Ray K. Daily.

Frouchtman, R. **A case of spring catarrh caused by light. The favorable effect of antergan.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1247-1253.

A case of spring catarrh in which light was the principal active irritant is reported because of two interesting features. Porphyrinuria, negative pollen tests, and a history of liver disturbances in the maternal family justify the assumption that the photosensitivity was due to a hepatogenic disturbance in the porphyrin metabolism. The second point of interest is the quick therapeutic response to antergan, a synthetic antihistaminic. Ray K. Daily.

Mairlot Nieto, Roberto. **Treatment of gonococcal conjunctivitis neonatorum.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 209-210.

The author has had good results in

treating patients with gonococcal conjunctivitis neonatorum locally with 30-percent solution of sodium sulfacetamide (Albucid). The instillations were given every half hour, day and night, for the first 48 hours, and every one or two hours on the following days. At the same time the eyes were washed with normal saline solution at frequent intervals. J. Wesley McKinney.

Poliak, B. L., and Gerasimenko, T. N. **Epidemiology, clinical course, and sulfa therapy of gonoblenorrhea.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 26-30.

The material comprises 42 patients with gonoblenorrhea, which was bilateral in 36. In 17 the cornea was involved, and in 11 it had perforating ulcers. No patient was admitted to the hospital earlier than four days after onset of the disease. Treatment consisted in insufflation of powder into the conjunctival sac and intramuscular or intravenous injections of the drug. The tabulated data show that intramuscular injections in children were as effective as intravenous injections in adults, and that the results following this form of therapy are better than those obtained by oral administration. Uncomplicated gonorrheal conjunctivitis is cured in this manner in five to seven days. No corneal complications ever developed after the administration of the drug began. The progress of infiltrates was arrested and the ulcers rapidly became clean. The sulfa drug frees the eye of infection, and at the same time inhibits epithelial growth. The rapidity with which the conjunctival sac becomes free of gonococci eliminates the danger of involvement of the second eye. Ray K. Daily.

Stern, H. J. **Sulphapyridine-resistant Koch-Weeks conjunctivitis.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp. 722-723.

In the East African Negro troops the author found much virulent conjunctivitis caused by the Koch-Weeks bacillus which did not respond at all to treatment with sulphapyridine.

Morris Kaplan.

Tranou. **Treatment of trachoma with sulfonamide.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1284-1288.

A controlled clinical investigation of 95 children with palpebral trachoma is reported. The children were divided into groups which were treated by means of oral administration of sulfonamides, oral administration combined with local therapy, local application of sulfonamide ointment alone, and subconjunctival injections of sulfa drug solutions twice weekly for six weeks. Oral administration of sulfa drugs lead to improvement in many cases, but to few cures. Better results were obtained by a combined local therapy with oral administration of the drug. The best results were obtained from subconjunctival injections of irgamid. Sulfathiazole, because of severe reactions, is unsuitable for subconjunctival injections.

Ray K. Daily.

6

CORNEA AND SCLERA

Angius, T. **Corneal involvement in Duhring's disease.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 290-297.

Duhring's disease is frequently confused with pemphigus and some writers consider it a form of the latter. The eruption is usually bullous but may be polymorphous and affects the skin of any part ofthe body. There is an eosinophilia of 10 percent in the blood and 90 percent in the bulla. The disease is

characterized by periods of remission, with a tendency to gradual subsidence. A case is described with ulceration of the cornea, in a 41-year-old man in whom the skin eruption had been present for 2 years. Eugene M. Blake.

Bakker, A. **Some researches on the respiration of the cornea in albino rats.** Brit. Jour. Ophth., 1947, v. 31, Feb., pp. 100-108.

A description is given of the technique of studying the influence of various concentrations of carbon dioxide and the absence of oxygen in the surrounding atmosphere, on the cornea of anesthetised albino rats. With the help of artificial respiration it was possible to shut the animals in a tank, and to expose the eyes under otherwise normal conditions to the gas under investigation. It could be determined that the so-called selective permeation of carbon dioxide through the cornea is not probable. Absence of oxygen in the surrounding atmosphere does not inhibit normal life of the cornea. The corneas remained transparent for many hours in an atmosphere of 8 percent of carbon dioxide and 92 percent of nitrogen. Special attention was paid to possible pathologic changes in the corneas after the experiments were finished.

O. H. Ellis.

Balcet, C. **Various forms of superficial punctate keratitis.** Rassegna Ital. d'Ottal., 1942, v. 11, March-April, p. 109.

Twenty-three cases of superficial punctate keratitis are described and from the observation of these, and from the study of the literature, Balcet believes that the name includes the infective form which has been seen often in the tropics. All of the different forms are herpetic in origin. In tropical and subtropical countries conditions which favor development of the disease are the hot and moist climate, poor hygiene and nutrition, plus a certain avitaminosis.

Eugene M. Blake.

Blanchi. G. **Primary adiposis of the cornea.** Rassegna Ital. d'Ottal., 1942, v. 11, March-April, p. 144.

The term primary adiposis of the cornea should be reserved for those cases in which no other severe ocular disease exists. It is a true lipoidosis of the cholesterine form, with a demonstrated disequilibrium of fatty metabolism. The cause is to be searched for in hormonal alterations, in the ovary, thyroid and hypophysis. Nor should the importance of the reticuloendothelial system be disregarded.

Two forms of corneal adiposis are recognized, the annular and the central discoid; the second form is considered a part of the annular type.

The literature is well abstracted and one case with histological study is reported. Eugene M. Blake.

Castroviejo, Ramon. **Indications and contraindications for keratoplasty and keratectomies.** Trans. Amer. Ophth. Soc., 1945, v. 43, pp. 324-330.

The author bases his conclusions on the study of more than 600 keratoplasties and over 100 keratectomies. Keratoplasty gives the better visual acuity. With keratoplasty it is not rare to obtain vision of 20/20 while with keratectomy astigmatism and residual haziness reduce vision to 20/100 or less. In glaucoma, it is usually advisable to make a very large iridectomy to reduce the danger of anterior synechia and the recurrence of glaucoma. Very favorable for keratoplasty are central

opacities where the transplant will remain surrounded by healthy corneal tissue, keratoconus, and interstitial keratitis when the transplant will remain in contact with healthy corneal tissue. A high percentage of clear grafts may be expected with final vision averaging better than 20/50 and not infrequently 20/20. Less favorable for keratoplasty, but still likely to give a high percentage of transparent grafts are corneal dystrophies, superficial corneal opacities, tear gas burns without pannus formation, adherent leukomas, descemetoceles following corneal ulcers or surgical procedure in or near the pupillary area, and interstitial keratitis with more extensive and denser opacity. Unfavorable for keratoplasty are corneal scars which include the pupillary area and extend to the limbus, extensive leucomas in which the transplant will be surrounded in more than one half of its circumference by dense scar tissue (keratectomy may improve vision or make the eye more favorable to undergo keratoplasty), band-shaped opacity, in which it is preferable to perform a partial superficial keratectomy, dystrophia adiposa, deep corneal burns with tear gas where preliminary superficial keratectomy is indicated, extensive corneal opacities caused by explosions that leave the cornea with a tatooed appearance, corneal opacities in aphakic eyes, extensive corneal opacities with superficial vascularization of the pannus type generally caused by burns, Fuchs's epithelial dystrophy, extensive corneal opacities with calcareous degeneration, corneal opacities caused by pemphigus, corneal opacities with pronounced nystagmus, and corneal opacities with extensive anterior synechiae.

C. D. F. Jensen.

Feigenbaum, A., and Kornblueth, W. **Posterior ring abscess of metastatic origin in Behcet's disease.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp. 729-734.

Behcet's disease is a constitutional disorder due to sepsis and characterized by aphthous stomatitis, recurrent ulcers, recurrent iridocyclitis, retinitis, optic neuritis, and skin eruptions on the lower extremities. The cause is usually streptococcus aureus.

In the case reported, the eye had a marked posterior ring abscess of the cornea and severe inflammation. The aqueous was cloudy, but no hypopyon was present. Posterior synechiae were numerous and there was a cataract. The tension was elevated. Despite large doses of sulphathiazole and daily paracentesis, the patient became worse and developed general septicemia. One million units of penicillin were given with rapid improvement; the eye, however, went on to phthisis bulbi.

Morris Kaplan.

Henkes, H. E. **On the distribution of glutathione and vitamin C in the lens and cornea.** Ophthalmologica, 1946, v. 112, Sept., pp. 113-128.

The object of the study was to determine the respective concentrations of vitamin C and glutathione in the various layers of lens and cornea. By means of a trephine, cylindrical pieces were removed from frozen corneas and lenses. These pieces were sectioned with the microtome at right angles to their axes. Alternate sections in groups of four were used for the glutathione and vitamin C determinations, which were made by iodine and dichlorphenolindophenol titration, respectively. Lenses and corneas of cattle, guinea pigs, and rabbits were studied under normal conditions as well as in a state

of experimental scurvy. In the lens the highest concentration of vitamin C was found in the subcapsular layers and of glutathione in the perinuclear layers. In the cornea the subepithelial stroma contained more vitamin C and glutathione than any other layer. Under conditions of experimental scurvy, vitamin C disappeared from the two ocular tissues within 14 to 19 days. The glutathione content remained unchanged. Peter C. Kronfeld.

Hercus, John. **Epidemic keratoconjunctivitis in Australian troops.** M. J. Australia, 1946, v. 2, Dec. 14, pp. 838-840.

A series of 56 patients with epidemic keratoconjunctivitis is reported. The patients were soldiers, and only one eye was involved in 50 of the patients. All had some form of corneal involvement, either superficial punctate staining or deeper infiltrates. There was a thin, stringy discharge, and in most cases a marked blepharitis. Cultures were negative, and attempts to grow the virus were unsuccessful. Treatment consisted of atropine, penicillin drops (500 Units per c.c.), bandaging of the eye for the first three to four days, and silver nitrate applied to the lids. If blepharitis was marked, 2-percent solution of gentian violet was used on the lid margins. The disease generally disappeared within nine days. The epidemiology was not determined although some association was noted with periods of heavy rainfall.

Benjamin Milder.

Katsnelson, A. B. **Ariboflavinosis in ocular diseases.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 18-23.

The author's impressions on the effectiveness of riboflavine in incipient cataract and corneal diseases are sufficiently favorable to stimulate future investigation. Ray K. Daily.

Katzin, H. M. **Contributions to the technic of corneal grafting.** Arch. of Ophth., 1947, v. 37, March, pp. 379-382.

Katzin describes his studies in corneal transplantation at the Cornell Research Laboratory. An automatic trephine is used, by which two or three grafts may be obtained from the donor eye. R. W. Danielson.

Kolenko, A. B. **Desensitization therapy of scrofulous keratoconjunctivitis.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 34-37.

Kolenko used subcutaneous injections of laktin and, when laktin was no longer available, fat free milk with a satisfactory and permanent result. Tabulated data show improvement in visual acuity with this form of therapy.

Ray K. Daily.

Latorre, S., and Crespi, G. **Treatment of herpetic keratitis with alcohol.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Sept., pp. 849-862.

The authors report good results obtained in the treatment of herpetic keratitis with 90 percent alcohol. The procedure is easy and is not dangerous. After instillations of cocaine, fluorescein is used to make the lesion more visible. Now the lesion is touched with the alcohol. The treatment may be repeated every three days until the lesion does not stain. They present 19 cases. In one the treatment failed because there was a secondary infection. (Illustrations.) J. Wesley McKinney.

Leopold, I. H., and Adler, F. H. **Use of frozen-dried cornea as transplant**

material. Arch. of Ophth., 1947, v. 37, March, pp. 268-276.

Keratoplasty has reached the stage today at which the demand for donor corneas has exceeded the supply. The small supply is largely due to the difficulty in preserving all available corneal tissue until the time at which it is needed. With the present methods of preservation, corneal tissue held over seventy-two hours is believed to be unsatisfactory for transplantation. The purpose of the experiment was to determine the value of frozen-dried cornea for corneal transplantation, as suggested by the preliminary experiments with rat cornea of Weiss and Taylor.

Fifty-nine of the 75 transplanted frozen-dried corneas healed in the recipient corneas. In 19 of these 59 grafts corneal vascularization occurred. In 6 of the 59 "takes," infection was an outstanding and early complication, and in 9 corneal edema persisted. Of the 16 eyes in which the transplant failed to remain in position, neither lid nor corneal sutures were used in 12.

The authors report that frozen-dried corneal tissue can be transplanted to normal rabbit eyes without an unusual host reaction. However, not one of the 59 "takes" with frozen-dried cornea were transparent at any time during the six months of observation.

R. W. Danielson.

Mann, I. **"Blue haloes" in atebrin workers.** Brit. Jour. Ophth., 1947, v. 31, Jan., pp. 40-46.

Six male patients who worked with powdered atebrin complained of seeing blue haloes around lights at night. They had pursued all ordinary protective measures and showed no dermatologic evidence of sensitivity. They had no other ocular complaints and vision was normal. On slitlamp examination all presented the same picture. The conjunctiva showed a diffuse pale yellow stain in the interpalpebral space only; at the limbus there were numerous minute dark brown spots. The whole surface of the cornea was covered by very fine yellow-brown particles which were actually imbedded in the cytoplasm of the superficial cells.

Experiments with rabbits showed that the granules were taken up by the cells directly from the surface and not through a systemic route. Once they appeared in the cells they did not dissolve but remained until the cells were normally cast off. The haloes were obviously a diffraction effect due to the opaque granules. The complaints were very mild, and disappeared without sequel in about two months after cessation of exposure.

Morris Kaplan.

Olontzeva, M. V., and Pokrovsky, A. I. **Denig's operation and transplantation of preserved tisssue by Filatov's method in the treatment of trachomatous pannus.** Vestnik Oft., 1946, v. 25, pt. 1, pp. 27-30.

Both operations consist of implantation of a transplant above the cornea parallel to the limbus; they differ in that Denig uses an autoplastic transplant of fresh tissue and Filatov uses a homoplastic transplant of preserved tissue. The authors used one procedure in one eye, and the other in the other eye, and selected subjects in whom the process was equally advanced in both eyes. During the occupation of Voronesh by the Germans this study was interrupted and Olontzeva perished.

Four years later, when the invaders were expelled, some of the patients returned and the results of the operations were checked.

The most important common factor is the surgical site above and parallel to the limbus. Implantations in other places on the eyeball gave inferior results. Transplantation of preserved tissue after Filatov has the advantage of more rapid absorption and a more pleasing cosmetic effect, but with this goes the disadvantage of a more rapid termination of the action of biogenic stimulants and the need for a repetition of the procedure. The effect of both procedures is usually temporary. Prolonged existence of severe pannus leaves as a consequence irreversible corneal cicatrical changes, and therapy should be energetic to shorten the course. Both Denig's operation and Filatov's procedure serve to stimulate regenerative processes.

Ray K. Daily.

Paraipan, Constantin. **Pneumococcic corneal ulcer healed in 24 hours with penicillin.** Amer. Jour. Ophth., 1947, v. 30, April, pp. 475-477. (5 references.)

Rubino, A., and Esente, I. **Comparison between experimentally produced signs of ocular ariboflavinosis and those observed in human nutritional deficiency of vitamin B_2** Riv. di Oftalm., 1946, v. 1, July-Aug., pp. 473-488.

This article consists of abstracts from the literature of the last years concerning experimental and nutritional ocular manifestations of riboflavine deficiency, and a few observations on the authors' patients. (Bibliography.)

K. W. Ascher.

Thygeson, P. **Marginal corneal infiltrates and ulcers.** Trans. Amer. Acad. Ophth., 1947, Jan.-Feb., pp. 198-209.

Marginal corneal ulcers are by far the most common corneal disease in this country. They are usually secondary to conjunctival and systemic disease. The most frequent types are the simple catarrhal, ring, and chronic serpiginous (Mooren's ulcer). In a detailed study of 200 consecutive cases of marginal ulcer, 180 were catarrhal, 14 ring, and 6 serpiginous. Of the 180 catarrhal ulcers, 156 were secondary to chronic catarrhal conjunctivitis, 12 to acute catarrhal conjunctivitis, 4 to endogenous conjunctivitis, and 8 without associated conjunctivitis. Staphylococci were isolated in 133, diplobacilli in 11, Koch-Weeks bacilli in 8. Coincidental blepharitis and conjunctivitis were a constant feature of ulcers caused by staphylococci and diplobacilli. In the treatment of the staphylococcic group, 5-percent sulfathiazole ointment, penicillin ointment, and 1 : 5000 oxycyanide with ammoniated mercury were most efficient. Staphylococcic toxoid was a successful adjunct in some cases. Topical applications to the ulcer apparently did not shorten its course, as did the treatment of the conjunctiva and lid margins with sulfonamides. There was no evidence that riboflavin or other vitamine deficiencies were a predisposing cause to marginal ulceration. Of the 14 ring ulcers, 3 were associated with bacillary dysentery, 2 with influenza, 1 with periarteritis nodosa, 2 with arthritis deformans, and 1 with lupus erythematosis. Ring infiltrate and ulcers secondary to staphylococcic conjunctivitis responded well to penicillin ointment. In one case due to bacillary dysentery, the use of sulfonamides was followed by rapid improvement. Paracentesis with intravenous typhoid therapy was also possibly of

value. In the treatment of chronic serpiginous ulcers sulfonamides and penicillin were without effect. Gifford's delimiting keratotomy apparently prevented advancement in some. Bacterial and other allergies may have been a causative factor in some cases. Marginal keratitis with acne rosacea is believed to be due to secondary staphylococcic infection. Chas. A. Bahn.

Thorne, B. **Epidemic keratoconjunctivitis in Bengal.** Lancet, 1946, v. 2, Nov. 16, pp. 715.

The author reports an epidemic of keratoconjunctivitis which occurred in 17 members of the R.A.F. in the Calcutta area. The disease was unilateral in 15 patients, appeared after an incubation period of 12 to 17 days, and lasted one to three weeks. Conjunctival cultures were negative, and no specific treatment was instituted.

Benjamin Milder.

Tikhova. **The use of albucide in the treatment of corneal ulcer, conjunctivitis, and trachoma.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 30-32.

Tikhova illustrates with case reports the beneficial effect of instillations and subconjunctival injection of 30-percent aqueous solution of albucide and of similiar ointments on the healing of corneal ulcers, arrest of secretion in conjunctivitis, and absorption of infiltrates in trachomatous pannus.

Ray K. Daily.

Van Veelen, A. W. C. **Bilateral spontaneous rupture of Descemet's membrane.** Ophthalmologica, 1946, v. 112, Sept., pp. 149-154.

A 32-year-old imbecile suddenly, and apparently spontaneously, developed a circumscribed clouding and thickening to three times normal of the cornea of first one eye and then the other. The clinical picture closely resembled that of acute hydrops of the cornea due to rupture of Descemet's membrane as it occurs in keratoconus, but all other signs of this disease were absent. One eye was enucleated because of marked proptosis and threatening perforation. In the other eye the area of corneal edema became regressive under conservative therapy and finally healed, leaving behind only a slightly protruding superficial corneal scar. Histologic examination of the enucleated eye revealed a primary rupture of Descemet's membrane with consequent severe edema of the stroma and secondary enzymatic breakdown of corneal tissue to the point of cavity formation. The cellular reactions were regenerative and reparative, rather than inflammatory. The question arises whether further observation will disclose signs of keratoconus. The author believes that self-inflicted injury can be ruled out. Peter C. Kronfeld.

Zondek, Bernhard, and Bromberg, Y. M. **Treatment of keratitis rosacea with small doses of testosterone.** Nature, 1947, v. 159, Feb. 1, p. 171.

Six patients with keratitis rosacea gave a positive intracutaneous test with testosterone. Tests with several other steroid hormones were negative. Striking improvement of the ocular condition in all the patients followed the intracutaneous administration of increasing doses of testosterone. When facial rosacea was present this also was markedly improved.

Despite the favorable results obtained, allergy to testosterone seems to be a cause in a high percentage of cases. Francis M. Crage.

7
UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Arruga, H. **The simultaneous detachment of the choroid and the retina after a cataract operation.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 119-125. (See Section 9, Crystalline lens.)

Cavallacci, G. **Uveoparotitis (syndrome of Heerfordt) and benign lymphogranulomatosis (disease of Besnier-Boeck-Schaumann).** Arch. di Ottal., 1946, v. 50, July and Aug. pp. 154-168.

Cavallacci reports one case of Heerfordt's disease. The patient had bilateral parotitis, and bilateral anterior chronic uveitis accompanied by recurrent mild fever. Absence of involvement of the cranial nerves is notable; most commonly involvement of the facial nerve is reported. Physical examination revealed mild hepatosplenomegaly and diffuse and painful swelling of the lymphatic glands. X-ray examination showed hilar adenopathy.

The intradermal reaction to tuberculin was positive. Histologic examination showed evidence of a reticuloendothelial disturbance, confirmed by monocytosis produced by adrenalin contraction of the spleen and by a study of smears following sternal puncture.

Four etiologic factors have been considered by the various authors: epidemic parotitis, syphilis, tuberculosis, and infection by an unknown virus. The unknown virus hypothesis has been championed primarily by Pautrier. He has shown in a very extensive monograph a great similarity between Heerfordt's disease and the disease of Besnier-Boeck-Schaumann, and believes that Heersfordt's disease is a cephalic localization of the latter, which is a complex picture that includes lupus pernio of Besnier, cutaneous sarcoidosis of Boeck and benign lymphogranulomatosis of Schaumann. It is a lymphatic disease with a benign course and is to be differentiated from malignant lymphogranulomatosis of Hodgkin-Paltauf-Sternberg.

A comparative histologic picture is common to the two diseases, characterized by involvement of the connective tissue with isolated or confluent nodules, of varied size, which are composed of aggregates of epitheloid cells, a minimum of lymphoid cells, and occasional giant cells. The most important finding is the absence of degenerative changes and caseation. Mickulicz disease and Sjögren disease may also be a part of the syndrome of Besnier-Boeck-Schaumann.

A similiar histologic picture can be obtained in many disease processes, and reticuloendotheliosis is not a response to a specific organism but rather the reaction to any one of many organisms which can call forth an immunizing allergic change. Cavallacci points out that his patient showed a positive tuberculin test, and favors this as the etiologic agent in his case.

Francis P. Guida.

Chavarria, F. A. **The importance of the ophthalmoscopic examination in conditions affecting the external parts of the eyes.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 161-169.

The author insists on the routine ophthalmoscopic examination even in those patients who complain of external conditions of the eyes. A patient was referred to him for operation on a

pterygium of the right eye, which had almost reached the pupillary margin and obstructed his vision. Fundus examination revealed a tumor of the choroid of the right eye which necessitated enucleation of the eye. (7 illustrations.) J. Wesley McKinney.

Dean Guelbenzu, Manuel. **Colloidometry of the aqueous humor.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1266-1276.

Dean Guelbenzu reports his colloidometric studies of the aqueous humor in various ocular diseases. There is an increased concentration of albumen in inflammations of the iris, ciliary body, and anterior part of the choroid, in corneal diseases accompanied by pericorneal congestion, in deep inflammations of the conjunctiva, in limbal phlyctenular keratitis, in acute inflammatory glaucoma, and after trauma which produces a sudden drop in tension. It is apparent that there is an inflammation of the ciliary body, and an alteration of vascular permeability in the region of distribution of the long ciliary arteries or the arteries anastomosing with them. The increased colloid content of the aqueous indicates a more or less pronounced cyclitis, and this sign may be the only evidence of a painless, quiet iritis. (Illustration.)

Ray K. Daily.

Gsell, O., Rehsteiner, K., and Verrey, F. **Iridocyclitis following leptospinosis pomona.** Ophthalmologica, 1946 v. 112, Dec., pp. 320-334.

The leptospiroses comprise a group of diseases of worldwide distribution due to infection with various species of pathogenic leptospira. The best known leptospirosis is infectious jaundice or Weil's disease of which iridocyclitis is a characteristic and fairly common complication. An acute, infectious, chiefly meningitic disease occurring characteristically in swineherds has been found to be a leptospirosis, due to infection with Leptospira pomona. A typical case of this disease occurred in a young man whose job it was to clean a large pigpen. Eleven days before the onset of the systemic disease, he had sustained an incised wound on one hand while at work. The wound "healed poorly," but did not cause any particular discomfort. The systemic disease took the course of a mild serous meningitis that subsided in three weeks. The leptospira could be cultured from the patient's blood on the third and fourth day, but not thereafter. Three months later the patient developed a mild iridocyclitis in one eye with a fibrous exudate that changed later on to precipitates and small brownish-gray nodules at the pupillary border. At the height of the iridocyclitis aqueous was aspirated and found to contain agglutinins for Leptospira pomona in significant concentration (in contradistinction to aqueous from other patients). "Since any other cause of the iritis could be excluded, it can only be regarded as a late complication of leptospirosis." The fact that the aqueous contained chiefly lymphocytes instead of the polymorphonuclear leukocytes which one would have expected to find in a fairly acute iritis, is stressed as another possible characteristic of the iridocyclitis due to leptospira.

Peter C. Kronfeld.

Johnson, L. V., Fried, N., Broaddus, C. C., and Lamfrom, H. **Use of neutralizing antibody test in diagnosis of human toxoplasmic choroiditis.** Arch. of Ophth., 1946, v. 36, Dec., pp. 677-684.

The procedure for the neutralizing antibody test for toxoplasma is described. Suspected serum is mixed with a suspension of the organism from mouse brain. This mixture is injected beneath the skin of a rabbit and the size of the lesion produced is compared with the lesion produced by the injection of the suspension of organism alone. In positive tests the antibodies in the serum inhibit the development of the skin lesion in the rabbit.

Thirty-two selected patients with chorioretinitis were tested; 20 of these gave positive reactions in the neutralizing antibody test. Cerebral calcification in patients who had toxoplasmosis with chorioretinitis was not observed when the age of onset was known to be over 15 years. If the disease was present at birth, calcification was evident.

A mother with reactivated toxoplasmic choroiditis and a woman who was probably congenitally infected each gave birth to a normal child. Two children probably infected congenitally with toxoplasmosis had younger siblings-german with antibody protection but no demonstrable infection. A case of chronic toxoplasmosis is described in which a quiescent chorioretinal lesion became activated during each of three pregnancies. (Color drawings of chorioretinitis.) John C. Long.

Jona, S., and Sartori, A. **Heerfordt's syndrome, a particular variety of Besnier-Boeck-Schaumann's disease.** Riv. Oto-Neuro-Oft., 1942, v. 19, Sept.-Oct., pp. 289-312.

A woman, 60 years of age, had bilateral iritis, bilateral parotid tumor, and paresis of her left seventh nerve. Biopsy of the tumor led to the diagnosis "Reticuloendotheliosis Besnier-Boeck-Schaumann, subtype Heerfordt's syndrome." A tuberculous etiology was excluded. The authors assume that the syndrome was caused by a hitherto unidentified virus. (8 illustrations, bibliography.) K. W. Ascher.

Longhena, Luisa. **The recurrent hypopyon-uveitis associated with mucocutaneous changes.** Riv. Oto-Neuro-Oft., 1946, v. 21, March-April, pp. 108-131.

Five cases are reported of a syndrome characterized by a typical uveitis associated with recurrent hypoyon of sudden onset, alternately in one eye or the other, and lesions of the mucous membranes and skin. A woman, 36 years of age, exhibited the typical eye symptoms, calcification of hilar glands and a positive tuberculin test. The vaginal mucous membrane presented superficial ulcers at each recurrence. Four other patients also had positive evidence of tuberculosis. After a long discussion of the different theories of the etiology of this disease the author concludes that the clinical and radiologic demonstration of pulmonary and extrapulmonary tuberculosis strongly suggests that the disease is a form of tuberculosis. (Bibliography.)
Melchiore Lombardo.

McLean, D. W. **An unusual case of intra-ocular hemorrhage.** Brit. Jour. Ophth., 1946, v. 30, Dec., p. 758.

Bleeding occurred from a strand of persistent pupillary membrane after very light trauma. After uneventful healing, the strand remained and in it could be seen a patent blood vessel in which movement of blood could be observed. Morris Kaplan.

Neubert, F. R. **Posterior uveitis in a case of sarcoidosis.** Brit. Jour. Ophth.,

1946, v. 30, Dec., pp. 724-728.

The author could find no record of posterior uveitis due to sarcoid and presents this case report as the first in the literature. In a young man who stated that his vision had rapidly deteriorated after looking at an eclipse, both fundi showed disseminated choroiditis with extensive scarring and pigment deposition. No diagnosis was made until he later developed signs of pulmonary tuberculosis with intestinal involvement. Resection of the cecum revealed sarcoidosis. Without further treatment, his general health and his vision improved. The fundus pictures remained the same. (2 figures.) Morris Kaplan.

Prosser Thomas, E. W. **So-called triple symptom complex of Behcet.** Brit. Med. Jour., 1947, Jan. 4, pp. 14-16.

In 1937 Behcet described an entity that consists of grave ocular disease and ulcers of the mucosa and external genitals. This is the first case to be reported in England. Eventually one eye had to be enucleated. Pathologic examination of the ocular tissue was not diagnostic. There was complete retinal detachment, gross intra-ocular hemorrhage, mainly subretinal, and marked patchy thickening of the ciliary body and choroid. (References.)

Bennett W. Muir.

Samoilov, A. I. **Present day conception of the pathogenesis of intraocular tuberculosis.** Vestnik. Oft., 1946, v. 25, pt. 6, pp. 3-7.

Samoilov believes that traces of an old tuberculous intrathoracic process can be found in the intrathoracic lymph glands or in the pulmonary parenchyma in every case of ocular tuberculosis. The bacilli circulating in the blood are arrested in the vascular labyrinth of the choroid and set up a small symptomless focus, which rapidly becomes and remains latent. At some future time lowered resistance permits the process to become active and at that time it is the only active tuberculous process in the organism. Samoilov's method of tuberculin therapy with focal reactions is based on this pathogenetic hypothesis.

Ray K. Daily.

8

GLAUCOMA AND OCULAR TENSION

Boxill, W. M. de C. **The flap sclerotomy in the treatment of glaucoma.** Brit. Jour. Ophth., 1947, v. 31, Feb., pp. 72-78.

The author describes in detail the flap sclerotomy which is Sir Richard Cruise's modification of the idea originated by Herbert in 1907. It has been used successfully in acute congestive glaucomas as well as chronic glaucomas for which it was designed. Under a conjunctival flap with corneal splitting a blunt triangular sclerotomy with corneal hinge is made. Postoperatively gentle massage is performed to delay primary union. After a permanent filtering cicatrix is produced the massage is discontinued. O. H. Ellis.

Braitseva, M. K. **Campimetry in the study of glaucoma. The effect of decompressing operations on the retinal edema and ophthalmotonus.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 7-12.

A tabulated report is given of a study of the effect of an Elliott operation on the size of the central and peripheral field and the ocular tension in 16 patients with glaucoma. An enlarged blind spot, found preoperatively, and interpreted as a sign of retinal edema, was reduced to normal immediately af-

ter the operation when the tension was subnormal. The blind spot remains within normal limits for at least ten days. After that the parallelism between the size of the blind spot and the intraocular tension does not continue. After six to eight weeks the enlargement of the blind spot recurs, and vision falls. There is apparently a constant parallelism between the scotoma due to retinal edema and visual deterioration. Another significant table contains the data on 138 glaucoma patients followed from one to ten years. It clearly shows a progressive deterioration of vision with a stable, normal ocular tension. At the end of one year, more than half of the patients retained their preoperative visual acuity; at the end of three years this was true of only one third of the patients, and at the end of ten years of only 11 percent. At the same time the tension remained normal in 92 percent of the eyes. The data support the conception of glaucoma as an initial retinal edema which gradually leads to irreversible atrophic changes of the nerve tissue, manifested in the late stages by peripheral contraction of the field or ring scotomas.

Ray K. Daily.

Cruise, Richard. **The production of a filtering cicatrix in glaucoma.** Brit. Jour. Ophth., 1947, v. 31, Feb., pp. 65-72.

Cruise presents the microscopic study of an eye upon which he had successfully performed his hinged-flap sclerotomy twelve years previously. The subconjunctival drainage area and corneoscleral tract were largely filled with a sponge of very delicate connective tissue. The walls of the tract were lined in part by definite endothelium; elsewhere the sclera was bare. In the latter areas the sclera had undergone no apparent change since the day of the operation. (10 figures and photomicrographs.) O. H. Ellis.

Dashevsky, A. I. **New pathways for the study of ocular tension.** Vestnik Oft., 1946, v. 26, pt. 5, pp. 18-27.

This is a preliminary report, with tabulated data on elastotonometry with a new instrument designed by the author. The technique allows a clearer recognition of the two basic factors in measurements of ocular tension: the true intraocular pressure, and the coefficient of the ocular reaction to pressure exerted by the instrument. The author presents a formula for calculating the coefficient of the ocular reaction to pressure, and the true intraocular pressure. The resolution of the data into their basic components permits a better understanding of the factors involved in the maintenance of the hydrodynamic ocular equilibrium. The reaction of the eye to pressure depends on the vascular apparatus of the eye, and the data show that it is directly proportional to the difference between the diastolic retinal pressure and the true intraocular pressure. When the two are equal, the coefficient of reaction becomes equal to zero. This indicates that the reaction coefficient is due to the difference in pressure on either side of the vessel wall, and that the vessel wall is the anatomic site of the process interpreted by the coefficient of reaction. Retinal edema is a manifestation of disturbances in the vessel wall. This supports the existence of a relationship between retinal edema and ocular tension. Ray K. Daily.

Downey, H. R. **Unequal tension as a sign in early glaucoma.** Trans. Amer.

Ophth. Soc., 1945, v. 43, pp. 495-504.

The author calls attention to the importance of unequal tension in the two eyes as a prodromal sign of the "preglaucoma stage" in patients over the age of 40 years. A difference in tension of 4 mm. and more is significant even in the absence of other manifestations of glaucoma. He found this difference in one third of 620 patients with healthy eyes and as frequently before the age of 40 years as after. He reports six cases of definite glaucoma in patients over 40 years of age whose only initial sign of preglaucoma was a difference in tension. C. D. F. Jensen.

Filatov, V. P. **Remarks on the technique of the LaGrange-Holt operation.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 39-41.

The distinguishing points of the technique are the use of a blunt-pointed keratome to make the incision, after the anterior chamber has been entered with a sharp-pointed keratome; the performance of a prophylactic sclerectomy in anticipated expulsive hemorrhage; and the use of tissue implantation to stimulate the recuperative forces of the organism.

Ray K. Daily.

de Grosz, Istvan. **Quantitative determination of follicular hormone in eye diseases.** Acta Ophth., 1941, v. 19, pt. 2, pp. 134-140.

Thirteen patients with glaucoma and eight with other eye diseases were tested for ovarian inadequacy by the determination of the folliculin content of the urine. The data show a low content of estrogenic substances, and suggest an etiologic relationship between ovarian inadequacy and certain types of glaucoma. Ray K. Daily.

Hess, Leo. **Pathogenesis of glaucoma and "glaucomatous" atrophy of the optic nerve.** Arch. of Ophth., 1947, v. 37, March, pp. 324-335.

This paper is one of a series on glaucoma by this author. He here brings out the point that glaucoma may be dependent not only on congenital anomalies of the eye, but may be associated with organic changes in the nervous system. R. W. Danielson.

Jona, S. **Injection of hypertonic glucose in the pre-operative treatment of glaucoma.** Rassegna Ital. d'Ottal., 1942, v. 11, March-April, p. 83.

The various salts and solutions which have been employed in the attempt to reduce the intraocular pressure in glaucoma are reviewed. The author doubts their value, except in the preoperative period and when combined with the use of miotics, at this stage. Twenty cases are reported in which 100 c.c. of 50-percent solution of glucose was injected intravenously in a period of ten minutes. In all of these patients there was a moderate reduction of pressure, lasting about two days. There were no inconveniences attendant upon the use of the glucose solution, and its employment before surgery is recommended.

Eugene M. Blake.

Just-Tiscornia, Benito. **Intraocular hypertension. Is the cause local or general?** Arch. de la Soc. Oft. Hisp. Amer., 1946, v. 6, Oct., pp. 989-998.

This is a report on a patient with general hypertension, with signs of bilateral vascular hypertension in the fundus and raised ocular tension, and with thrombosis of the central retinal vein and glaucomatous excavation in the right eye. The author belives that the local changes in the ocular capil-

laries form the fundamental disturbance, which leads to the increased intraocular pressure, and that the general high blood pressure had no significant influence on the ocular tension.

Ray K. Daily.

Kolenko, A. V. **Metabolism in glaucoma patients.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 45-47.

The data on metabolism of 100 glaucoma patients, 71 with primary and 29 with secondary glaucoma, show that metabolism is usually raised in patients with primary glaucoma, and low in patients with secondary glaucoma.

Ray K. Daily.

Lawrence, Arthur. **Glaucoma following herpes.** M. J. Australia, 1947, v. 1, Jan. 18, p. 78.

The author presents four brief case reports to draw attention to the fact that glaucoma may follow herpes. Although this is probably secondary glaucoma, the glaucoma may supervene when no sign of iritis can be detected with the slit lamp. F. H. Haessler.

Marin Amat, M. **The pathogenesis of glaucoma.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Oct., pp. 1012-1026.

The author's conception of the pathogenesis of glaucoma is summarized. The rise of intraocular pressure is produced directly by the increased intraocular volume of blood and lymph; obstruction to drainage is secondary. A rapid rise in intraocular contents produces an acute glaucoma; if the increase takes place slowly the glaucomatous process is chronic. The control of the intraocular circulation is under the influence of the sympathetic system, directed autonomically and locally by the small ganglia situated within the ciliary body and the choroid. Dysfunction of the local regulating mechanism breaks the sympathetic-vagotonic equilibrium which regulates the quantity of blood entering and leaving the eyeball. The result of this disturbance is a vasodilatation and stasis, increased permeability of the capillary endothelium, and intraocular hypertension. The mechanism of the dysfunction may be a primary excitation of the sympathetic followed by an overactivity of the parasympathetic, or a primary parasympathetic excitation. Consequently glaucoma is always predominantly a reaction of the vagus. The clinical implications of this concept are the importance of prophylactic avoidance of all excitation of the sympathetic nervous system and the necessity of acting therapeutically on the nervous plexus in the ciliary body and the root of the iris. The therapeutic goal should be a diminution in the production of intraocular fluids and not promotion of their elimination. The autonomic function of the local sympathetic innervation of the eyeball explains the failure of intervention on the sympathetic cord or its ganglia to reduce ocular tension.

Ray K. Daily.

Marlow, Searle B. **The field of vision in chronic glaucoma.** Trans. Amer. Ophth. Soc., 1945, v. 43, pp. 608-625.

The author presents his observations on 50 cases of chronic glaucoma, showing the effect of reduced illumination on the field of vision. He compares his findings with those of earlier observers, emphasizing the conclusions of outstanding investigators in the field of perimetry such as Traquair and Ferree and Rand. He presents 13 perimetric charts which demonstrate the amplification of known or suspected field de-

fects by the use of illumination reduced to an intensity of 0.20 foot candles. He compares these field findings to those with full illumination which ranged from 10 to 40 foot candles in intensity. He concludes that in all perimetric studies the illumination should be measured and recorded.

C. D. F. Jensen.

Norkus, V. N. **Elastotonometric investigations with the pressure test in glaucoma.** Vestnik Oft. 1946, v. 25, pt. 5, pp. 35-39.

The technic of the Dashevski pressure test is as follows: the corneal diameter is reduced to and maintained at 7.9 mm. by pressure with the glass prism of the elastotonometer. Tonometric readings are taken every 10 seconds for two minutes, and the data charted to form a curve. The object of the test is to elucidate the changes that take place in the normal and glaucomatous eye under pressure. The reaction has two phases: a fall in ophthalmotonus, and its restoration. This investigation was concerned with the component factors of ocular tension in the phase of restoration. The eye was subjected to an elastotonometric examination, then subjected to pressure for two minutes, and the elastotonometric examinations were repeated every five minutes until the original level of ocular tension was restored. The tests were made also on the fellow eye that was not subjected to pressure. The data on 22 glaucoma patients show that the eye responds to pressure by a change in the ocular tension and in the coefficient of reaction. These two basic factors change in opposite directions in eyes with a normally functioning regulating mechanism of ocular tension. With a high true intraocular pressure the changes in the coefficient of reaction are insignificant. The tonometric tension as understood clinically is modified in the presence of high true intraocular pressure. In average and low true intraocular pressure both the pressure and the coefficient of reaction participate in the change. In slight compression of the cornea as is practiced clinically the tonometric reading depends but little on the coefficient of reaction. The changes in the fellow eye were similar to those in the eye that was subjected to pressure.

Ray K. Daily.

Parker, F. C. **Modified corneal incision with iridodialysis and iridectomy for opening the anterior chamber angle.** Arch. of Ophth., 1947, v. 37, March, pp. 277-281.

When one visualizes the point of attack in making the incision for the conventional iridectomy, one cannot but be impressed with the fact that the very area, namely, the angle of the anterior chamber, which should be kept patent, is in serious danger of being subsequently closed by cicatrical contraction or resultant inflammatory changes. An area which should be kept free is traumatized, with the possibility of producing conditions worse than the primary one.

Parker says that the failures in some cases of basal iridectomy might be attributed to the aforementioned location of the conventional incision. In performing an iridectomy, it is almost impossible to cut down to the base of the iris without leaving a stump, however small. Any remnants of iris can still block the angle. He, therefore, places the incision in the clear cornea away from the limbus, where subsequent contraction and other changes would

not in any way interfere with drainage. In addition, the location of the incision facilitates iridodialysis, which is the best procedure for clearing the angle of the anterior chamber.

With a Graefe knife, an incision is made straight through and across the cornea about 3 mm. below the limbus, with the blade of the knife tilted slightly downward to make a beveled cut. The iris is grasped well toward the base and pulled slightly downward with a swaying motion, and is stripped clean from its base high up in the angle. The resulting coloboma can be made of almost any size desirable. The iris is drawn down and out through the incision and cut off first at one extremity of the incision, after it has been pulled away medially from the end of the wound, and then at the opposite end. In replacing the pillars, the tiny stream of an anterior chamber irrigator is employed rather than a spatula, to guard against any possible damage to the capsule of the lens.

Parker does not advocate the performance of this iridodialysis and iridectomy through the modified corneal incision in every case of glaucoma. It should be employed in any eye in which iridectomy might be considered.

R. W. Danielson.

Payne, B. F. **Causes of failure of glaucoma operations.** Southern Med. Jour., 1947, v. 40, Jan., pp. 11-17.

Unsuccessful glaucoma surgery requires that the surgeon, in fairness to his patient, himelf, and the profession, investigate the cause for the failure. Histologic study of enucleated eyes in the cases showing poor results is required. The causes for such results in some of the common operations for acute and chronic glaucoma are studied and reported.

Before showing the histologic changes in glaucoma, the microscopic anatomy of the normal globe is briefly reviewed.

Enucleated glaucomatous eyes following unsuccessful iridectomy, iris inclusion operation, cyclodialysis, and trephine showed thinning of the sclera and cornea, changes in the corneal epithelium, congested scleral sulcus and limbus, shallow anterior chamber, anterior peripheral synechias, and atrophy of the iris and ciliary body.

Photographs of sections of enucleated globes after the above named unsuccessful operations clearly illustrate the cause of the failures. In the iridectomy the root of the iris was left behind and the synechias therefore not relieved. The iris inclusion drainage canal was not permanent. Inflammation closed the tract made by the cyclodialysis operation. The trephine failures were due to collapse of the bleb, late infection, and fibrotic closure. (Photomicrographs.) Francis M. Crage.

Rios Sasiain, Manuel. **The mechanism of introcular hypertension in the light of the polarographic method.** Arch. de la Soc. Oft. Hisp.-Amer., v. 6, 1946, Oct., pp. 999-1011.

Rios subjected the intraocular fluid to an examination by the polarographic method, with the curves recorded photographically. The analytic apparatus and the preparation of the intraocular fluid obtained through posterior sclerotomy or from the anterior chamber is described in detail. The normal aqueous is alkaline, and the polarographic curve indicates the presence of a small protein content in the intraocular fluids. In the hypotensive eye the polarographic curve shows an increase in protein which inhibits the reduction of the ions of cobalt. In the hypertensive

eye the physicochemical equilibrium, which regulates ocular tension is disturbed; neurovegetative instability, endocrine dysfunction, intramural action of histamin, or all of these factors combined, lead to a vascular dilatation and increased capillary permeability. This leads to the diffusion of colloidal proteins, which normally do not pass through vascular walls; the osmotic pressure of the intraocular fluid rises, and the quantity of the intraocular fluid is increased. Chemically the passage of negative ions into the eye raises the alkalinity, and the pH becomes further removed from the isoelectric point.

Ray K. Daily.

Rokitskaia, L. B. **Investigations of the oculoöcular phenomena by elastotonometry.** Vestnik Oft. 1946, v. 25, pt. 5, pp. 28-31.

This is a further investigation in the elucidation of the mechanism of the binocular response to a monocular stimulus. It is generally regarded as a vasomotor reaction, transmitted to the fellow eye through nervous associations. Dashevsky's investigations with elastotonometry revealed that the clinical tonometric data consist of the interaction of two factors: the true intraocular tension and the coefficient of reaction. Elastotonometric data determine the reaction coefficient, or the reactive capacity of the eyes. Inasmuch as this coefficient is determined by the elasticity of the vascular wall, a study of the coefficient may give some indication of the part played by the vascular system in the various processes concerned. This study was concerned with the binocular reaction to pressure on the globe with Dashevsky's instrument, which acts on the true intraocular pressure, and to retrobulbar injections of 1:1000 solution of atropine, which acts directly on the vessel wall and thus indirectly on the coefficient of reaction. The graphically reported data show that in normal eyes the effect of pressure on the true intraocular tension and on the coefficient of reaction runs parallel in both eyes, and that pressure on one eye elicits a binocular response which is less marked and appears somewhat later in the fellow eye. In eyes with glaucoma the reactions were variable and inconstant, owing probably, to the extreme lability of the nervous mechanism of such eyes. Retrobulbar injections of atropine produced definite changes in the coefficient of reaction in most cases with but little effect on the true ocular tension and the same response was found in the fellow eye. These findings thus cast doubt on the conception of oculoöcular reactions as purely vasomotor phenomena.

Ray K. Daily.

Sadikova, V. C. **Results of cyclodialysis.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 42-45.

A review of the literature, and an analysis of 100 operations on 93 patients is reported. Among these were 7 cases of compensated glaucoma, 87 of uncompensated, 2 of absolute, 1 of acute glaucoma, and 3 of juvenile. There was a shallow anterior chamber in 70 cases, moderate in 21, and deep in nine. There was postoperative iridocyclitis in six. The criteria in this investigation were the visual acuity, peripheral fields, and ocular tension. The tabulated data show an improvement in visual acuity in patients with poor vision. In patients with good vision there was a reduction in visual acuity in 25 percent attributed to the changes brought about by the surgical intervention, such as pigment in the anterior chamber, folds and detachment of

Descemet's membrane, and refractive changes. In 86 cases ocular tension was gradually reduced, as were the oscillations in ocular tension. The visual field increased in 25 patients and became contracted further in 11. (4 tables.)

Ray K. Daily.

Samoilov, A. I. **New pathways in the study of glaucoma.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 3-7.

The theories on the pathogenesis of glaucoma are reviewed. Samoilov is convinced that the basic process in the initial stage of glaucoma is an edema of the eyeball, localized predominantly in the retina, and has specific characteristics. Among these is the typical reaction of the glaucomatous eye to pilocarpine and adrenaline. Adrenalin has a pronounced pupillomotor effect but no effect on the retinal edema; pilocarpine produces less miosis in the glaucomatous eye than in the normal, but produces a significant diminution in the retinal edema. If persistent the retinal edema gradually passes into an atrophy of the optic nerve. This process is not specific for glaucoma. The fact that the visual acuity continues to deteriorate in many cases in which the tension has become normal after surgery is evidence to Samoilov that the ocular tension is not the cause of the visual deterioration. Ray K. Daily.

Samoilov, A. I., and Briantseva, M. K. **Campimetric test in darkness in the diagnosis of prodromal glaucoma.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 12-17.

The most sensitive test for prodromal glaucoma is the demonstration of the presence of retinal edema through an enlargement of the blind spot. This demonstration is possible under conditions of dark adaptation before it is demonstrable in the light adapted eye. One has the patient remain in a dark room for one hour, takes the adaptation curve to verify the state of adaptation, and then outlines the blind spot, using a feeble light for fixation, and a small red light for the test object. After a return to normal illumination the blind spot soon resumes its normal size. One of the interesting observations made in the course of this investigation, was that frequently the normal eye of a glaucomatous patient showed an enlarged blind spot in dark adaptation. Of nine eyes found normal ophthalmoscopically, tonometrically, and functionally only three had a normal size blind spot when dark adapted. (Adaptation curves, blind spots.) Ray K. Daily.

Sugar, H. S. **Acute glaucoma: a follow-up study.** Amer. Jour. Ophth., 1947, v. 30, April, pp. 451-468. (1 chart, 3 tables, 8 references.)

Vanýsek, Jan. **The problems of glaucoma.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp. 742-748.

The author believes that glaucoma may be an expression of tissue edema in the eye; this is either an ordinary edema or more probably an allergic type. The ordinary swelling may be either inflammatory, as in iritis or iridocyclitis, or cardiac edema, as in thrombosis of the central vein of the retina. The allergic edema is brought about by an imbalance in opposing divisions of the vegetative nervous system. The frequency with which glaucoma is precipitated by excitement that upsets balance between the sympathetic and the parasympathetic functions is cited as evidence of this. A further evidence is given the fact that tension is higher during the night when the sympathetic system is more active, and less ele-

vated during the day when the parasympathetics hold sway. The author acknowledges there is no proof of this hypothesis, but feels that much more thought should be given it.

Morris Kaplan.

Vidal, F., and Malbrán, J. L. **Chronic primary glaucoma and differential white cell count.** Arch. de Oft. de Buenos Aires, 1946, v. 21, Jan.-March, p. 58.

The differential white cell count in the blood of 21 patients with chronic primary glaucoma and 14 with secondary glaucoma was found to be normal. (Bibliography.) Plinio Montalván.

Vintserevich, M. A. **Elastotonometric analysis of the action of miotics in glaucoma.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 32-35.

The material for this investigation comprises 67 glaucoma patients tested for the effect of miotics, and 200 glaucoma patients examined without consideration of the action of miotics. The elastotonometric data show a variable response to miotics owing, probably, to the extreme lability of the nervous system in glaucoma. Varying and sometimes contradictory responses may follow the same stimulus. Nevertheless the data reveal a number of interesting phenomena. They show that the lower the true ocular tension is, the higher is the coefficient of reaction. A low coefficient of reaction was found in eyes with absolute glaucoma with a high true ocular tension. In compensated glaucoma the coefficient is higher. An elastotonometric examination furnishes three data: a tonometric datum which is obtained by measuring the pressure necessary to deform the cornea to produce a plane surface 4.8 and 7.9 mm. in diameter; and the true intraocular pressure and the reaction coefficient, which are calculated. Under the influence of miotics the tonometric data remain unaltered, and the true ocular tension and the reaction coefficient undergo a change usually in opposite directions. In lower tension the coefficient rises and vice versa. In a few cases the two components change in the same direction. No significant difference was found in varying the concentration of the miotics. In the light of elastotonometric data our conception of the action of miotics needs revision. (Elastotonometric curves.)

Ray K. Daily.

Wexler, D., and Kornzweig, A. **Buphthalmos in a six month premature infant. Arch. of Ophth.,** 1947, v. 37, March, pp. 318-323.

Infantile glaucoma, or buphthalmos, has been discovered occasionally in newborn infants at term. The present case is of special interest because it affords an opportunity to study congenital glaucoma in microscopic section at an earlier stage than has hitherto been possible. On section, it was found to belong to the small group of cases of buphthalmos characterized by absence of Schlemm's canal, complete anterior iris synechias and very shallow or absent anterior chamber. These anatomic features were striking in comparison with the deep anterior chamber and hydrophthalmos more commonly found in congenital glaucoma.

Of clinical interest in this premature infant with buphthalmos is the presence of a hereditary tendency to familial congenital glaucoma, and of consanguinity of the grandparents. Detailed measurements of the eye are compared to those of a normal six-month fetus. R. W. Danielson.

9

CRYSTALLINE LENS

Arruga, H. **The simultaneous detachment of the choroid and the retina after a cataract operation.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 119-125.

In 1868, H. Knapp described the first case of detachment of the choroid in an enucleated eye recently operated upon for cataract. At the time of the enucleation, it was believed that the patient had developed a sarcoma of the choroid. In the presence of detachment of the choroid following cataract extraction or trephining the patient is usually not aware of any disturbance but if the detachment is very large he may notice the contraction of the visual field with an area of blindness having a convexity directed toward the center. The retraction of the visual field goes through a period of progression and regression which may last days or weeks. With rare exceptions there is complete restitution. The fundus may show one or more raised areas resembling a tumor of the choroid. The mass is not opaque to transillumination and shows a hard reddish reflex. The rest of the fundus is normal. The anterior chamber is almost always very shallow due to the lack of healing of the operative wound. Predisposing causes of the detachment are considered to be old age, hypertension, and dyscrasias, especially diabetes. In a few cases there is an associated detachment of the retina which carries the same favorable prognosis as the choroidal detachment. It is believed that the detachment is probably due to congestion ex vacuo which produces an exudate from the vascular membrane itself. The retinal detachment is thought to have the same cause. The author has examined 242 patients postoperatively. He observed detachment of the choroid in 9; in 3 of the 9 there was also a contiguous detachment of the retina. He concludes that the above figures indicate the relative frequency of choroidal detachment and associated retinal detachment resulting from intraocular surgery. (4 illustrations.) J. Wesley McKinney.

Bettman, J. W. **Production of cataracts in chicks with dinitrophenol.** Arch. of Ophth., 1946, v. 36, Dec., pp. 674-676.

It has not been found possible to experimentally produce cataracts in mammals by the ingestion of dinitrophenol, although this has been done in young chicks and ducks. The author produced cataracts in 3½-weeks-old pullets by placing them on a diet containing 0.25 percent 2:4 dinitrophenol. Within seven hours definite lenticular opacities were noted in each eye of all the chicks. The opacities were limited to the anterior and posterior subcapsular regions. The cataracts regressed to a considerable degree even while the drug was still being administered. White mice and congenitally obese yellow mice failed to develop cataracts under the same conditions.

John C. Long.

Cassidy, J. V., and McFarland, C. B. **Arachnodactyly (Marfan's syndrome) associated with ectopia lentis.** Amer. Jour. Ophth., 1947, v. 30, April, pp. 469-474. (19 references.)

Cordes, F. C. **Types of congenital cataract.** Amer. Jour. Ophth., 1947, v. 30, April, pp. 397-420. (24 figures, 84 references.)

Decker, P. H. **A method of closing the cataract incision by combining a corneoscleral suture and a large sliding**

conjunctival flap. Trans. Amer. Acad. Ophth., 1947, Jan.-Feb., pp. 210-213.

The author successfully uses the following technique to secure adequate approximation and sealing of the incision in 125 operations. The conjunctiva is circumcised as in enucleation over the upper three fifths of the limbus and undermined sufficiently to prevent tension. With a 6-0 black silk suture, a horizontal corneoscleral mattress suture is inserted and tied after the completion of the operation. The conjunctival flap is then brought down over the upper half of the cornea and held in place with two sutures. These sutures are removed on the fourth day and the corneoscleral suture on the twelfth.

Chas. A. Bahn.

Disler, N. N. **Three cases of injury of the lens without subsequent cataract formation.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 40-41.

In the course of development of traumatic cataracts, Disler observed peripheral, subcapsular, round or elongated vacuoles not connected with the perforation in the lens capsule. They are the first sign of an impending opacification of the area; they indicate a progressive hydration of the tissue and inescapable opacification. Gradually the groups of vacuoles and the number in each group increases. They become confluent and form a continually extending ring in the lenticular periphery, which joins other areas of hydration and opacification. Disler also had under observation three injuries of the lens, in which these peripheral opacities were absent. All three remained without the development of cataract for the three years. One lens had a glass splinter partially imbedded in it. The other lens was perforated by a piece of copper which lodged in the vitreous; the third lens contained a fine transparent foreign body in its superior inner quadrant. Disler infers that in trauma of the lens the peripheral vacuoles are of prognostic significance.

Ray K. Daily.

Galois, A. **Cataract extraction with keratome incision.** Ann. d'Ocul., 1946, v. 179, Sept., pp. 492-497.

The use of a keratome instead of a Graefe knife for cataract extraction is advised to avoid increased delayed healing and iris prolapse. A keratome incision is suggested which is so large that enlargement with scissors is not necessary. The technique described has been used by the author in 250 cases during a period of eight years. This is essentially the technique suggested by Duverger and Velter. In operating on the left eye a suture through the external rectus is used for fixation; on the right eye, a suture in the internal rectus. The conjunctiva is dissected down to the limbus. With a large keratome a limbal incision is made several mm. to the left of the vertical meridian. The keratome is passed as far into the anterior chamber as possible and in its withdrawal the section is enlarged by means of the lateral cutting edge on one side. A total iridectomy is performed. If the lens capsule is very tense due to lens intumescence a very small puncture with the cystotome is made in the capsule near the equator preliminary to intracapsular extraction. Nasal and temporal scleral corneal sutures are used. Chas. A. Bahn.

Henkes, H. E. **On the distribution of glutathione and vitamin C in the lens and cornea.** Ophthalmologica, 1946, v. 112, Sept., pp. 113-128. (See Section 6, Cornea and sclera.)

Maestro, Tullio. **The ascorbic acid content of the cornea.** Rassegna Ital. d'Ottal., 1941, v. 10, Sept.-Oct., pp. 487-500.

Eighteen white rats were fed upon a diet deficient in vitamin A. The oxidation of the fatty acids and their esters was studied and the results were related to the changes in human cataractous lenses. The respiration of the opaque human lens is raised by the fatty acid esters. The present researches confirm the finding of this oxidation in the lens, which has been previously demonstrated in many other tissues. Butyric acid was shown to be especially active upon the cataractous lens fibers. Eugene M. Blake.

Nicolato, A. **Two hundred cases of intracapsular cataract extraction.** Rassegna Ital. d'Ottal., 1942, v. 11, Jan.-Feb., p. 3.

Intracapsular and extracapsular extraction of cataract are compared. The necessity for careful study of each eye is stressed, so that the attempt to remove the cataract in its capsule will not fail. The author feels that the intracapsular method gives better results in every way and that late complications are less frequent than with the classical procedure. Eugene M. Blake.

Villa-Coro, A. **Optic nerve atrophy after a cataract operation.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Sept., pp. 901-904.

The importance of this work is to suggest the incidence of optic nerve atrophy after a cataract operation when the atrophy has no other cause. After 5,000 cataract operations the author found that 10 of these patients developed optic nerve atrophy.

J. Wesley McKinney.

10

RETINA AND VITREOUS

Arruga, H. **The simultaneous detachment of the choroid and the retina after a cataract operation.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 119-125. (See Section 9, Crystalline lens.)

Bailliart, P. **Circulation of the retina and general medicine.** Wien. Klin. Wchnsch., 1946, v. 58, June, pp. 332-337.

The observation of the retinal circulation is becoming more and more important for specialists and for general physicians. The oculist sees in the retinal vessels the basis for the retinal nutrition, the neurologist pictures in them the state of the cerebral vessels, the physiologist and general physician finds in them clues to the behavior of the peripheral circulation which is responsible for the life of the cell and influences the general blood pressure. We are able to measure the pressure of retinal arteries and veins, can measure their thickness, can observe the circulation of the blood corpuscles, can estimate the elasticity of their walls and can even photograph them. Because strong drugs changed the caliber of the vessels only little and the existence of vasomotor nerves in both cerebral and retinal vessels has been denied, it was assumed that the general blood pressure was the responsible factor for the pressure in these organs. Stimulation and excision of the nervous elements of the carotid sinus showed that the pressure changes in the retinal arteries do not correspond to the general blood-pressure. The caliber of the retinal vessels is no longer important. In its place we emphasize the local pressure measured by the dynamometer. The circu-

lation in a given area varies according to its activity at any given time. The exchange of the substances necessary for the metabolism of the cells is variable and is regulated by changes in the tonus and not by changes in the caliber of the vessel wall. If the tonus increases, the blood pressure increases in this area. A spasm of the peripheral vessel is not normal and is the exception. If the tonus of an artery decreases, the pressure does not only sink in the artery, but in the capillaries and veins of the area as well. Increased peripheral pressure decreases the blood supply of the area through increased resistance. The blood pressure, as it is measured consists of the true pressure plus the tension of the blood vessel wall. The latter is relatively insignificant in an artery with a thin muscular wall, but is significant in the retinal arteries. It is the tonus of the wall which keeps up the circulatory pressure and counteracts the effect of gravity, it is this tonus which varies with excitement, which may cause higher or lower local pressure in cases of generalized hypertension or which may slow down the local circulation to complete interruption. Retinal hemorrhages may or may not be associated with general hypertension. Hemorrhages may be an expression of localized hypotony as in pernicious anemia. It is too often forgotten that the blood vessels themselves are composed of cells and that they themselves undergo pathologic changes. At first these diseased cells only cause a disturbance of the normal metabolic interchange, later they may disintegrate and permit the exit of blood from the vessel. A degeneration of the cells of the whole vessel wall leads to obliteration. In the case of end arteries like those in the brain and in the retina such obliteration means sudden functional death, which, unless the obliteration is quickly relieved, becomes permanent. Embolism in the retinal arteries and venous thrombosis and their consequences in the retina are also described. Max Hirschfelder.

Baquis, Mario. **Retinal hemorrhages from strain.** Rassegna Ital. d'Ottal., 1941, v. 10, July-Aug., pp. 417-437.

Baquis defines overwork, or strain as an activity of a working individual surpassing physiological limits in intensity or duration. The strain may be physical or psychic, muscular or mental. Three cases of sudden loss of vision due to hemorrhages of the retina which followed excessive muscular effort are described. E. M. Blake.

De Leonibus, F. **The ability of the normal lens to survive the oxidation of some amino acids.** Rassegna Ital. d'Ottal., 1941, v. 10, Nov.-Dec., pp. 547-556.

De Leonibus reports briefly upon our present understanding of the metabolism of the amino acids, with particular regard to the researches upon the influence of these substances upon the retina. The method of Warburg was further employed to study the relation of the amino acids to the lens in concentrations of M/100, at p_H of 7.2. The results were not conclusive. Certain of the amino acids increased the respiration of the lens, and others decreased this property. Apparently the amino acids play a minor role in the metabolism of the lens. Eugene M. Blake.

Ershkovich, I. G. **Tissue therapy in traumtic changes of the vitreous during the World War.** Vestnik Oft., 1946, v. 25, pt. 1, pp. 16-20.

This study is based on 20 cases of vitreous opacity following war injuries,

14 of which were perforating and six contusions. In two eyes intraocular foreign bodies were extracted, and six contained nonmagnetic foreign bodies. Half of the injured had additional injuries of the face, chest, and extremities. In eleven patients there was a dense organized exudate encapsulating a foreign body and in five of them the retina was detached. In seven there was a hemophthalmos, and in two retinitis proliferans. Of the twenty patients three had only one eye, and one had both eyes injured. Tissue therapy was instituted one to nine months after the injury. In 10 patients tissue therapy was combined with osmotherapy and autohemotherapy. There was improvement in 18. The favorable effect was observed in six eyes containing an intraocular foreign body, and in six with retinal detachment. The author urges a trial of this therapy in eyes regarded as hopeless. Ray K. Daily.

Ferrié, J. **Macular lesions of degenerative appearance and their relation to tuberculosis.** Ophthalmologica, 1946, v. 112, Sept., pp. 135-148.

For a number of years the author has been especially interested in the distinction between inflammatory and degenerative macular lesions. In 1941, together with Lafont, he presented before the ophthalmological Congress of Southern France (Montpellier, June, 1941) a study of Stargardt's disease associated with a neurologic syndrome of the order of Friedreich's ataxia. Of this combination of hereditary macular and neurologic disease, Ferrié now reports two cases (father and daughter) with typical macular lesions of the Stargardt type but definite evidence of congenital syphilis. Ferrié then describes and depicts in color a bilateral chronic macular disease of typically degenerative appearance in four adults with definite evidence of active or arrested pulmonary tuberculosis. The author's ophthalmoscopic criteria of degenerative macular disease appear to be the same as those used in English-speaking countries. Rather cautiously and without any definite evidence other than the coexistence of the two conditions he suggests a tuberculous etiology of macular lesions of degenerative appearance in definitely tuberculous adults.

Peter C. Kronfield.

Givner, I., and Bruger, M. **Associated systemic factors in retinitis pigmentosa. Arch. of Ophth.,** 1947, v. 37, March, pp. 261-267.

This study was prompted by two cases of retinitis pigmentosa with unusual associated conditions. An attempt to determine whether these additional factors were constantly present led to laboratory investigations, of which this paper is a preliminary report. The present series includes 14 patients.

The unusual feature of one case was a spinal fluid pressure of 300 mm. of water. In the other patient the spinal fluid was under normal pressure, but the total protein measured 194 mg. per hundred c.c. (normal 15 to 40 mg.) and the chlorides 1,195 mg. per hundred c.c. (normal 700 to 750 mg.). In addition, the basal metabolic rate was 17 percent below the average and creatinuria was present.

No abnormalities in pulse rate, blood pressure or temperature were observed in 14 patients with retinitis pigmentosa. The serum cholesterol was within normal limits. The basal metabolic rate was within or below normal limits. Eleven patients had creatinuria. Spinal fiuid pressure and total protein content of the spinal fluid was definitely

increased. Hepatic damage was not demonstrable. The fasting ascorbic acid content of the plasma was reduced in seven of nine patients on whom this determination was carried out. Vitamin A studies on the serum of seven patients gave normal values.

In 11 patients pupillographic studies showed tonohaptic reactions and other evidences of diencephalic disorders. Tests failed to reveal any measurable impairment in renal function in 13 patients. Physical examination, including neurologic studies, gave essentially normal findings except for the high incidence of high-arched palate and nerve deafness. R. W. Danielson.

Goldfeld, R. G. **Tissue therapy of fundus changes with hole in the macula due to contusions.** Vestnik Oft. 1946, v. 25, pt. 1, pp. 24-26.

Three of four eyes with traumatic hole in the macula treated by tissue therapy were improved. The improvement is attributed to the absorption of edema and exudate in the parimacular area. It is suggested that all patients with such injury be given the benefit of this therapy. Ray K. Daily.

Hallum, Alton V. **Retinal arterioles in the hypertensions of pregnancy.** Trans. Amer. Ophth. Soc., 1945, v. 43, pp. 585-607.

Hallum offers a classification of retinal arteriolar spasm in toxemia of pregnancy, based on the degree of retinal arteriolar spasm. He considers its evaluation a distinct aid in determining if, and when, pregancy should be terminated. C. D. F. Jensen.

Jordano Barea, Jose. **Localization of the tears in an operation for detached retina. Thermoluminous caliper method.** Arch. de la Soc. Oft. Hisp.-Amer., 1945, 5, Dec., pp. 1130-1136.

The instrument consists of an ophthalmoscope to which is added a metallic arm. Into this is placed a long curved electrode. Thus, one has a caliper whose intraocular arm is the light projected by the ophthalmoscope and the extraocular arm is formed by the electrode. The electrode marks the place of the tear on the sclera. (6 illustrations.) J. Wesley McKinney.

Jordano Barea, Jose. **Thermoluminous caliper method for localization of the tears in detached retina.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 203-208.

In a previous article published in this journal in December, 1945, the author describes his method of the thermoluminous caliper. Now he gives further advice about its use.

J. Wesley MicKinney.

Maestro, Tullio. **Changes in the retinal arterial pressure in a patient suffering from a paralysis of the cervical sympathetic nerve.** Riv. Oto-Neuro-Oft., 1942, v. 19, Nov.-Dec., pp. 413-421.

A 30-year-old married woman developed a typical Claude Bernard-Horner syndrome two days after an injection had been given into the thyroid gland. The intraocular pressure remained equal in both eyes during four months, but the diastolic arterial pressure stayed higher in the eye on the side of the sympathetic lesion for about two months. The differences in pressure varied from 5 to 10 millimeters when measured with the ophthalmodynamometer of Bailliart. The ptosis, miosis, and enophthalmos did not disappear when the diastolic arterial pressure became equal in both eyes. During

this time, no changes in the retinal vessels could be seen. K. W. Ascher.

Niven, C., Jr., Washburn, M., and Sperling, G. **Growth retardation and corneal vascularization with tyrosine and phenylalanine in a purified diet.** Proc. Soc. Exper. Biol. and Med., 1946, v. 63, Oct., pp. 106-108.

The addition of 1 percent DL-phenylalanine and 1 percent L (-) tyrosine to a purified diet containing 10 percent casein produced growth retardation and external lesions. Phenylalanine is converted to tyrosine in the animal and so may add to the effect of the tyrosine. The addition of relatively large amounts of nicotinic acid or L (-) tryptophane will appreciably alleviate the deleterious effects of these amino acids. Theodore M. Shapira.

Pereyra, Lorenzo. **Coats' disease.** Riv. di Oftalm., 1946, v. 1, July-Aug., pp. 489-509.

The author reports a clinical study of two cases of bilateral Coats' disease and a histologic study of one eye that was enucleated because of decompensated glaucoma. Vascular, degenerative, and proliferative lesions were encountered histologically. The most impressive vascular lesion consisted of an enormous dilatation of the choroidal network; the thickness of the choroid was five times that of the normal membrane. The retinal vessels, on the other hand, were constricted, even partly occluded, and showed thickening of their walls. Degenerative changes were found in the retina, particularly in those layers adjacent to the exudate which was found between the choroid and the retina and which, on chemical examination, showed a high globulin content. Proliferative lesions found in the retina faintly resembled a glioma which, however, was excluded by the absence of atypical cells and by the relative preservation of the retinal cytoarchitecture. The transudate located between the choroid and the retina was believed to originate from the enormously dilated and permeable choroidal vessels; the essence of this lesion was assumed to be a malformation, an angiomatosis belonging to the group of hamartomas. A hypoplasia of the choroidal vessel walls seemed to be the primary cause of the dilatation of these vessels and of the enormous transudation which interfered with the normal nutrition of the retinal tissue. The remissions which were observed in many eyes affected by Coats' disease as well in those described by the author, may well be explained by temporary resorption of a part of this transudate. A relationship to Hippel-Lindau disease is mentioned. (Bibliography, 10 photomicrographs.) K. W. Ascher.

Pokrovsky, A. I. **The pathogenesis and therapy of retinal detachment of tuberculous origin.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 17-20.

The clinical history of a patient is reported to show that in the presence of tuberculous chorioretinitis a slight trauma may lead to retinal detachment with a hole which simulates idiopathic detachment. The presence of a retinal tear is an indication for diathermy coagulation, but a favorable surgical result should not lead to the neglect of general therapy including tuberculin therapy. Ray K. Daily.

Samoilov, A. I. **Retinal edema in tuberculous diseases of the anterior ocular segment.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 20-25.

Case reports illustrate the occurrence of retinal edema complicating anterior uveal tuberculosis without choroidal involvement. The low visual acuity sometimes found in anterior uveitis may be due to the retinal edema. Calcium iontophoresis is valuable diagnostically in diminishing the edema, and consequently the size of the scotoma. Calcium iontophoresis is a valuable desensitizing measure, and also a therapeutic procedure for diminishing the edema and restoring function. Further investigations will show whether the retinal edema represents a specific tuberculous process in anterior uveitis, or may occur in similar processes of other etiology. Ray K. Daily.

Sandomirsky, L. **A case of Purtscher's retinopathy.** Vestnik Oft., 1946, v. 25, pt. 4, pp. 44-45.

A soldier was struck in the occipital region with a heavy piece of wood, and the following morning he noticed loss of vision in the left eye, which was found to be due to Purtscher's retinopathy. The loss of vision was permanent. The literature on this rare condition is reviewed. (Illustration.)
Ray K. Daily.

Skorodinskaja, V. V. **The treatment of retinitis pigmentosa with extract of leaves of aloes.** Vestnik Oft., 1946, v. 25, pt. 1, pp. 9-12.

This clinical study done at Tashkent comprises 12 cases. Nine adults and three children were studied. Eight of the 12 patients had impairment of hearing. They had been treated with favorable results with intramuscular injections of cod-liver oil. During the war this was not available and the extract of leaves of aloes was given in 1 to 2 c.c. doses, daily or every other day, for 45 injections. In some cases tissue implantation was also done. Extension of the visual field, increased visual acuity, or diminished hemeralopia were considered signs of improvement. Detailed reports show that improvement appears after the eighth to the thirteenth injection. The first sign of improvement was an extension of the visual field, visual acuity rose next, and adaptation was the last function to improve. The courses of treatment were repeated every two to three months, because at the end of the third month visual acuity fell again. In children the extract can be administered in the form of small enemas. The period of observation varied between 7 and 18 months. Whether the process could be permanently arrested cannot be determined from this study, but it is obvious that the effect of therapy is favorable. It manifests itself not only in the ocular function, but also in the general condition of the patient. Ray K. Daily.

Streiff, E. B., and Monnier, M. **Influence of vestibular irritation on retinal arterial pressure and on general blood pressure.** Riv. Oto-Neuro-Oft., 1942, v. 19, March-April, pp. 81-100.

The authors studied the changes produced by irrigation of the vestibulum of anesthesized rabbits and cats. Water at 45 to 50 and at 5 to 18 degrees centigrade was used, and the arterial pressure in the retina was measured. Another series of experiments was performed on cats with previously interrupted brain stem and cervical sympathetic tracts. Galvanic irritation of the bulla ossea was also used. Clinical observations were correlated with these animal experiments. During vestibular irritation a drop in both general and retinal arterial blood pressure was noted; after cessation of the irrita-

tion, the general blood pressure returned to normal and the retinal arterial pressure surpassed its original values ("hypertensive reaction"). This hypertensive reaction was not observed in animals in which the cervical sympathetic or the pontine tracts had been destroyed. (Extensive bibliography; schematic drawings of high didactic value). K. W. Ascher.

Weeker, L. **Adhesive episcleral reaction in the operative treatment of retinal detachment.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp. 715-722.

Ordinary operative methods of treatment of detached retina aim primarily at the formation of an adhesive choroiditis at the site of the retinal tear. In studying the healing of knife punctures through the bulbar walls in rabbits, it was seen that the newly formed episcleral connective tissue penetrated through the sclera and became attached very firmly to the retina. The same condition prevailed in human eyes similarly penetrated before removal for various causes. The author believes that this adhesive episcleral reaction is essential for the permanent reattachment of the retina. It takes place irrespective of the method of perforation.

He describes an operation procedure that gives a satisfactory adhesive episcleral reaction. First the nonperforating diathermic electrode is applied to the sclera in the area of the tear. This serves to promote the usual adhesive choroiditis. Then a diathermy needle 2 mm. by 0.15 mm. with the least amount of current for easy perforation is used to puncture the tissues from 3 to 20 times. Lastly the sclera and choroid are punctured with an actual cautery point for the evacuation of subretinal fluid. (4 figures.)

Morris Kaplan.

11

OPTIC NERVE AND TOXIC AMBLYOPIAS

Bushmich, D. G., and Getman, V. P. **Tissue therapy in optic atrophy.** Vestnik Oft., 1946, v. 25, pt. 1, pp. 20-24.

The introduction of methyl alcohol into the occupied areas by the German occupying forces led to a number of cases of methyl alcohol poisoning and optic atrophy. This clinical experience comprised 25 patients with an optic atrophy of from two months to two years duration. The majority of these patients had been treated without significant effect by means of blood transfusions, strychnine injections, and intravenous injections of sodium iodide. Because of the advanced stage of the process these patients were given several courses of combined tissue therapy in the form of implantation of preserved skin and placenta, intramuscular injections of cod-liver oil, subcutaneous injections of extracts of preserved leaves of aloes and placenta. The visual acuity and visual field for form and colors were checked every other day. Visual acuity improved in 17 cases, and the visual field in 14. In six patients with no light perception and in one with imperfect light projection there was no improvement. The period of observation extended from 4 to 18 months, and during this time the improvement was stable. While the improvement consisted only in several hundredths of visual acuity, the results are nevertheless considered encouraging because of the gravity of the process and because former therapy was ineffective. The better results reported by Bushmich in the treatment of traumatic optic atrophy suggest that perhaps early treatment before irreversible pathologic processes had time to develop might have been more effec-

tive. It is advocated that this form of therapy be administered within the first few days after the poisoning, with the object of stimulating the fermentation capacity of the tissues and eliminating the action of products of decomposition of methyl alcohol on the optic nerve.

Ray K. Daily.

Casari, G. F. **Vitamin A test in the differential diagnosis of optic atrophy and chronic glaucoma simplex without manifest hypertension.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 305-314.

Casari made carefully controlled tests of the light minimum, the light difference, and color perception in cases of optic atrophy and probable early glaucoma. The patients were then given 600,000 units of vitamin A in oil orally. Patients affected with optic atrophy and with chronic glaucomă simplex present a definite disturbance of the light sense, with manifest hemeralopia. The use of massive doses of vitamin A improves the light sense in simple atrophy but has no affect in glaucoma, and therefore, may be used to differentiate between the two conditions.

Eugene M. Blake.

Gandolfii, C. **Optic neuritis from focal infection.** Riv. di Oftalm., 1946, v. 1, July-Aug., 441-445.

A unilateral intraocular neuritis healed completely after removal of a granuloma of one molar tooth.

K. W. Ascher.

Maestro, Tullio. **Choked disc "ex vacuo."** Riv. Oto-Neuro-Oft., 1943, v. 20, March-April, pp. 112-134.

A 12-year-old girl developed a unilateral choked disc in an eye with a severe tuberculous keratitis. When, after three months, the cornea had healed and intraocular pressure had returned to normal, the disc regained a normal appearance. The mechanism of the papilledema and related conditions is extensively discussed and the conclusion is reached that three factors contribute to the development of the choked disc. An increase of the intravenous pressure is the most important, and slowing of the venous flow and interference with the lymph return are the contributory causes. (Bibliography, 2 figures.)

K. W. Ascher.

Sanchez Martinez, L. **The tumors of the frontal lobe.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 170-189.

Two cases of frontal lobe tumor are reported. The first had simple optic atrophy in the left eye with marked concentric contraction of the peripheral field, absolute central scotoma and achromatopsia and in the right eye papilledema of six diopters, narrow arteries, large and tortuous veins, slight contraction of the peripheral field and enlargement of the blind spot. A diagnosis of a tumor of the left frontal lobe was made. The second case was one of tumor of the right frontal lobe. There was bilateral papilledema of five or six diopters, the disc was covered with exudate and hemorrhagic dots, the arteries were narrow and the veins large and tortuous. There was slight concentric contraction of the peripheral fields with enlargement of both blind spots. (Illustrations.)

J. Wesley McKinney.

12

VISUAL TRACTS AND CENTERS

Brockman, N. W., and Van Hagen, K. O. **Denial of own blindness (Anton's syndrome).** Bull. Los Angeles Neurol. Soc., 1946, v. 11, Sept.-Dec., pp. 178-180.

Patients who deny blindness usually present considerable intellectual deterioration, impairment of memory, disorientation and confabulation. There is complete blindness apparently due to bilateral involvement of the optic lobes or optic radiations. The pathogenesis of this condition is incompletely understood, but appears to be due to a disturbance in the to and fro circuits between the thalamus and the occipital cortex. Two typical cases are reported.

O. H. Ellis.

Caramazza, F. **Meningioma of the tuberculum sellae.** Riv. Oto-Neuro-Oft., 1943, v. 20, Jan.-Feb., pp. 1-18.

A woman, 32 years of age, noticed fogged vision in her left eye in 1939. Her right pupil was slightly larger. Both discs were pale. Disc borders, retinal vessels, and retinal vascular pressure were normal. Vision of the right eye was 10/10. The left eye counted fingers at 30 centimeters only. Visual field examination revealed a right homonymous hemianopsia, no central scotoma on the right field and a definite left central scotoma. Neurologic and laboratory findings were negative; radiography of the skull revealed anteroposterior enlargement of the sella (X-ray photographs), small anterior and posterior clinoids, normal optic canals, and no signs of increased intracranial pressure. Encephalographic findings were negative. Surgery revealed the presence of a meningioma of the tuberculum sellae, flattening of the compressed left optic nerve and discoloration of the right optic nerve. The right eye retained vision of 10/10. The difficulties of the preoperative diagnosis were due to the lack of encephalographic findings typical for the Cushing meningiomas. K. W. Ascher.

Colaciuri, Vittorio. **Neurochiasmatitis of vascular and of meningeal origin.** Riv. Oto-Neuro-Oft., 1942, v. 19, Nov.-Dec., pp. 357-381.

This is a histologic study of the inflammatory lesions in and about the optic chiasma of eight patients, suffering from syphilitic (5 cases), tuberculous, and an unknown meningocerebral disease and disseminated sclerosis. The syphilitic lesions showed increased interstitial connective tissue, hyperplasia, and new formation of blood vessels, scanty myelin degeneration and rarefaction of the axis cylinders. Few changes were seen in the glia and in the leptomeninges. These latter structures showed definite alterations in the three patients with nonsyphilitic disease; myelin degeneration and axis cylinder rarefaction were also present. The author suggests means to differentiate neurochiasmatitis of vascular origin from meningeal. (12 photomicrographs; 11 references.)

K. W. Ascher.

Frantz, Russell, and Vogel, P. J. **Visual hallucinations as localizing manifestations of lesions of the temporal and occipital lobes.** Bull. Los Angeles Neurol. Soc., 1946, v. 11, Sept.-Dec., pp. 135-144.

The authors present two cases in which visual hallucinations, one of color and the other of highly organized animate objects (on one occasion colored), were present and seemed to have a localizing value. A review of the recent literature calls attention to widely divergent opinions as to the significance of visual hallucinations in localization.

O. H. Ellis.

Fortunato, Francesco. **Ocular signs produced by cysts of the pouch of**

Rathke. Riv. Oto-Neuro-Oft., 1943, v. 20, March-April, pp. 69-93.

One year after a marked diminution of his sexual functions, a 36-year-old man noticed visual disturbances and general exhaustion. In the course of the next two years he gained 11 kilograms in weight, suffered from headaches, pain in his neck, paracusis, flickering in his left eye, weakness of his legs, incontinence, vomiting, and one attack of generalized convulsions. Neurological findings were normal except for a slight diminution of his olfactory and gustatory senses. Vision was 5/60 in the left and 9/10 in the right eye; the visual field of the left eye was constricted for colors in its lower half, and showed a large (20 degrees) central scotoma, the field of the right eye had a relative central scotoma for colors. The left disc was surrounded by edema and its temporal half was pale; the right disc showed an incipient papilledema. The sella was enlarged and its borders markedly destroyed. A craniopharyngioma was diagnosed, and partly removed. After the operation, the atrophy of the optic nerves proceeded and vision deteriorated. A Cushing decompression operation was performed two months after the first intervention. The final vision was 4/60 in the right eye, and amaurosis in the left eye. (6 figures, bibliography.) K. W. Ascher.

Pedico, O. **Chronic serous meningitis.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 319-333.

Pedico emphasizes that chronic serous meningitis is frequently confused with brain tumor, especially in the chiasmatic region, and that the ophthalmologist is often the first physician to be consulted. Such cases may assume medicolegal importance and are especially important in an ambulant soldier whose chief complaint is severe head pain. The papilloedema, the skull radiograph, and the type of cephalalgia are the chief factors in diagnosis. In the case described the ophthalmodynamometer of Bailliart demonstrated increase of intracranial pressure.

Eugene M. Blake.

Rubino, A. **Chiasmal syndrome associated with endocraniosis hyperostotica (Morgagni).** Riv. Oto-Neuro-Oft., 1942, v. 19, March-April, pp. 101-132.

Two patients are described. The disease, which was first mentioned by Morgagni (1765) is best named hyperostosis frontalis interna. Rubino considers an opticochiasmatic arachnoiditis to be the main pathogenetic factor and neurohypophyseal complications should be explained as sequelae. Circulatory disturbances are a predominant feature of the syndrome, and were obvious, in Rubino's patients, ophthalmoscopically as well as roentgenologically. (13 illustrations, bibliography.)

K. W. Ascher.

13

EYEBALL AND ORBIT

Azzolini, Umberto. **Anterior noncommunicating encephalocystocele.** Riv. Oto-Neuro-Oft., 1942, v. 19, Sept.-Oct., pp. 338-350.

An 11-months-old male infant had an anterior encephalocystocele as large as his fist which increased during crying. It was reducible by pressure during the first weeks of life, but not later. It was situated between the right ethmoid and frontal bones and contained cerebrospinal fluid. The author assumes that the encephalocystocele lost its communication with the subarachnoidal space because of an inflammatory proc-

ess, probably congenital syphilis. Only four similar cases have been described previously (Bibliography, 3 illustrations.) K. W. Ascher.

Cadili, G. **Osteoma of the maxilla with encroachment on the orbit.** Riv. di Oftalm., 1946, v. 1, July-Aug., pp. 459-472.

Partial removal of a maxillary osteoma reduced the disfiguring exopthalmos without interfering with the function of the eye. (4 figures, bibliography.) K. W. Ascher.

Courville, C. B., and Schillinger, R. J. **Intracranial complications of the eye and orbit.** Bull. Los Angeles Neurol. Soc., 1946, v. 11, Sept.-Dec., pp. 102-110.

In a series of thirty thousand autopsies the authors found only one proven case of orbital actinomycosis that had caused secondary intracranial complications. Malignancies can extend along the optic nerve or erode intracranially. Trauma may simultaneously involve the orbit and cranial cavity. Infections and granulomas of any origin may invade the intracranial cavity and cause septic meningitis or thrombosis of the cavernous sinus. However, the rare orbital tuberculomas or syphilomas almost never extend intracranially.

O. H. Ellis.

Godtfredsen, Erik. **Ophthalmo-neurological symptoms in connection with malignant nasopharyngeal tumours.** Brit. Jour. Ophth., 1947, v. 31, Feb., pp. 78-100.

Malignant nasopharyngeal tumors are of fairly rare occurrence, but are more frequent in males. Ophthalmologic symptoms are often present. These symptoms occur chiefly in the period when the exact diagnosis has not yet been made, but the ophthalmologist should be able to diagnose them correctly. The eye symptoms in decreasing order of frequency were sixth nerve paresis, paresis of the third nerve, visual pathway lesions, paresis of the fourth nerve, Horner's syndrome and exophthalmos. The ophthalmoplegias generally manifested themselves as massive paralyses with associated clinical findings. The visual pathway lesions presented various degrees of severity from a slight impairment of vision to the more frequent total amaurosis with atrophy of the optic nerve or choked disc. Local rhinologic and otologic symptoms occur and large metastatic cervical glands appear early.

Intensified irradiation produced a remarkable percentage of five year cures. (16 illustrations.) O. H. Ellis.

Juzefova, F. I. **Experimental investigations on the pathogenesis of metastatic ocular tuberculosis.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 7-13.

This is a report of a detailed study on guinea pigs. There were three series of experiments. In one a culture of tubercle bacilli was introduced into the vascular system of the guinea pig; in some of them one eye was subjected to trauma. In another series the guinea pigs were sensitized to horse serum by repeated injections. The final dose was introduced into various tissues of the eye. A culture of tubercle bacilli was introduced into the blood at the same time. A third series, for control, was only sensitized to horse serum. In the first series a high immunologic state of the ocular tissues resulted. Only one of the nine animals developed a tuberculous choroiditis; apparently the trauma was ineffective. In the sec-

ond series 18 out of 20 animals developed a nodular tuberculosis at the site of the last traumatizing injection and in the iris. In the nontraumatized eyes the tuberculous process involved the choroid. These findings demonstrate conclusively the role of the preliminary sensitization in the development of ocular tuberculosis. The hypersensitivity which favors the development of tuberculosis need not be a tuberculous allergy. The ocular lesions of the animals of the third series had no specific character. Ray K. Daily.

Kisner, W. H., and Mahorner, H. **Unilateral exophthalmos: an early sign in thyrotoxicosis.** Surg. Gyn. and Obstet., 1947, v. 84, March, pp. 326-331.

As an early sign of hyperthyroidism, unilateral exophthalmos is not rare. It may be the only sign of incipient toxic goitre and may precede by months all other subjective and objective findings. Vascular lesions and tumors are the most frequent causes for unilateral exophthalmos.

According to Cavity this condition is sometimes confused with upper lid retraction (Dalrymple's sign). Again there may be bilateral proptosis but the fact that both eyes share in this sign is not recognized. Cavity reported three cases where this sign was the first sign in Graves' disease and the diagnosis was not established until 6, 8, and 20 months had elapsed.

The authors discuss the cause, pathology, treatment, and some experimental work on exophthalmos. They feel that there is little doubt that in some cases of Graves' disease the immediate effect of thyroidectomy is unfavorable. Many weeks or months later the process subsides and usually the eyes return to normal. Radical procedures such as the Naffziger operation should be deferred for as long as two years after thyroid removal.

Francis M. Crage.

Kogan, N. D. **Fire-arm injuries of the orbit.** Vestnik Oft., 1945, v. 24, pt. 4, pp. 11-15.

On the basis of a clinical experience with 48 orbital wounds Kogan concludes that the gravest injuries are the orbitocranial or those involving the sinuses. Orbital injuries should have a roentgenologic as well as a neurologic examination. In isolated perforating ocular injuries one should keep in mind the possibility of a double perforation with penetration of fragments into the skull, and subsequent neurologic complications. Surgical intervention should be a joint task of the ophthalmologist, rhinologist, and neurosurgeon. Provision of ophthalmologic service at the front or prompt transport of the wounded to specialized hospitals is the best prophylactic measure against complications and death.

Ray K. Daily.

Longhena, Luisa. **Cranio-orbital fracture complicated by diplococcic meningitis.** Riv. Oto-Neuro-Oft., 1943, v. 20, March-April, pp. 94-111.

An apparently slight injury to the orbit suffered during an air raid was followed by a fatal meningitis. Purulent posttraumatic meningitis usually results from an infection that penetrates through a cranial fracture into the subarachnoidal space. Often, the first meningeal signs appear before the surgeon realizes that there is a bony lesion. Even without infection in the accessory nasal sinuses, a severe meningitic complication may follow the injury, due to the presence in the normal

mucous membranes of a varied bacterial flora. Negative nasal examination and initially good condition of the patient do not warrant a favorable prognosis. Injury to the dura and to the brain proper increases the danger. (2 figures, bibliography.)

K. W. Ascher.

Marin Amat, M., and Diaz Gomez, E. **Exophthalmos in orbitocranial tumor.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Feb., pp. 190-202.

A 24-year-old woman with a marked exophthalmos of the left eye had pallor of the optic disc, large and tortuous veins, and slight concentric contraction of the peripheral field in the left eye and slight pallor of the papilla with enlarged veins and temporal hemianopsia in the right. A diagnosis of orbitocranial tumor was made. The operation showed that the exophthalmos was due to a tumor mass of the cranial cavity that had spread to the orbit. (6 illustrations.) J. Wesley McKinney.

Marucci, L. **Bilateral exophthalmos of unequal degree.** Rassegna Ital. d'Ottal. 1941, v. 10, Sept.-Oct., pp. 527-538.

Slight bilateral exophthalmos occurred in a man, 38 years of age. Periodically there was an increase in the proptosis and some edema of the lids, hyperemia of the conjunctiva, but no feeling of distress. The author concludes that there is an intraorbital angioma, with a neurovascular lability, that results in an augmentation of the exophthalmos of the right eye. Roentgen radiation brought about a satisfactory result, both as to the exophthalmos and the crises. E. M. Blake.

Mastrangeli, Wilfredo. **Tuberculoma of the orbit.** Riv. di Oftalm., 1946, v. 1, July-Aug., pp. 446-458.

Di Marzio distinguishes the following types of orbital tuberculosis: secondary to tuberculous disease of the eyeball; extension from the orbital bones or accessory sinuses of the nose; isolated orbital tuberculosis; symmetrical tuberculosis of both orbits. In a woman, 58 years of age, a tentative diagnosis of orbital tumor led to removal of a tumor measuring 3 by 1 centimeters. Histologically, a miliary hyperplastic tuberculosis was diagnosed (two microphotographs). The Pirquet reaction was strongly positive, and an X-ray examination showed residual unilateral pleuritis. Not infrequently an orbital tuberculoma may be mistaken for a neoplasm. K. W. Ascher.

Olivella, Antonio. **Intermittent exophthalmos.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Sept., pp. 905-912.

A case of a young man is reported, who within a year developed an intermittent exophthalmos of the left eye. A detailed clinical study showed that the exophthalmos was due to an orbital varicocele. J. Wesley McKinney.

Renard, G., and Offret, G. **Angiomas of the orbit.** Arch. d'Opht., 1946, v. 6, no. 3, pp. 284-313.

Orbital angiomas are more common than is generally realized and removal is necessary in the majority of instances. Surgical removal in toto is the only logical procedure.

Cavernous angioma is the most common anatomic form. It is a well-defined tumor of variable size and location with a tendency to localize near the inner wall of the orbit. The tumor commonly displaces the globe forward and laterally and may deform it by pressure inducing ametropia. Radiographic study shows enlargement of the orbit on the affected side. The authors call

attention to the fact that symptoms of angioma commonly appear in childhood but do not become incapacitating until adult life. Although these tumors are usually removable without difficulty, in exceptional instances adhesions to the extraocular muscles have occurred. Complications of operation include ptosis, oculomotor paralyses, anesthesia of the cornea, and optic atrophy. The authors describe in detail the microscopic anatomy of cavernous hemangioma, defining three anatomic types, cystic angioma, angiolipoma, and hemolymphangioma.

Simple angioma, while less common, is more variable and is capable of greater extension. It frequently extends beyond the orbit and is associated with nevus flammeus of the lids and of the face. Simple angioma has no capsule and tends to infiltrate widely in the orbit, menacing the integrity of all the intraorbital structures. Its surgical removal is difficult and is often followed by hemorrhage and sensory and motor disturbances. The histopathologic characteristics of this tumor are also described in detail.

In a discussion of the pathogenesis of orbital angioma the authors note its congenital nature and the lack of any hereditary or definitely predisposing factors. Phillips Thygeson.

Schneider, J., and Frankel, S. S. **Treatment of late postoperative intraocular infections with intraocular injection of penicillin.** Arch. of Ophth., 1946, v. 37, March, pp. 304-307.

In two patients extracapsular cataract extraction was followed by late intraocular infection and was treated with intraocular injections of penicillin. In each case final vision was light perception.

The authors conclude that the intraocular injection of penicillin for late postoperative infections is well tolerated by man and the eye may be saved from evisceration by early injection of penicillin. R. W. Danielson.

Shmeleva, Z. G. **Some characteristics of ocular tuberculosis in the postwar period.** Vestnik Oft., 1946, v. 25, pt. 6, pp. 25-28.

Thirty-two patients with metastatic ocular tuberculosis were treated with tuberculin, and 12 with nonspecific therapy. An analysis of the material in comparison with prewar patients shows a shift towards an older group of patients, a greater general and local sensitivity, and a tendency to punctate hemorrhages, sometimes as focal reactions. These new tendencies in the clinical course call for greater caution in tuberculin therapy, and for the combination of this form of therapy with general hygienic and supportive measures. Ray K. Daily.

Stallard, H. B. **A plea for lateral orbitotomy (Krönlein's operation).** Brit. M. J., 1947, March 29, pp. 408-409.

The Krönlein operation is preferred to the transfrontal technique in the removal of a neoplasm the physical signs of which show it to be entirely within the orbital cavity. There is more direct and adequate exposure. A case of a neurofibroma situated within the muscle cone, which was missed by the transfrontal approach is presented.

Irwin E. Gaynon.

Talkovsky, S. I. **Ophthalmic symptoms of aneurism of the internal carotid in anophthalmos.** Vestnik Oft., 1945, v. 24, pt. 4, pp. 23-26.

Talkovsky saw four fire-arm injuries, with the point of entry at the temple, and exit from the orbit, followed by

destruction of the eyeball, and the development of an arteriovenous aneurysm of the internal carotid. The anophthalmos and the consequent absence of a pulsating exophthalmos obscured the presence of the aneurysm; the only symptom that arrests attention is the persistent edema and swelling of the soft tissues that results from the venous congestion of the orbit. The diagnosis is important because an attempt to enucleate the remains of the eyeball may lead to fatal hemorrhage. These patients need special vocational guidance, because even insignificant trauma may result in serious complications. Ray K. Daily.

Weizenblatt, S. **Penicillin in treatment of acute endophthalmitis.** Arch. of Ophth., 1946, v. 36, Dec., pp. 736-738.

A man, 49 years of age, had Elliott's trephine operations in each eye five years ago for chronic glaucoma. Six months later the right eye was lost because of infection with Staphylococcus aureus. The left eye had had three previous infections from which it recovered. A fourth infection, caused by Staphylococcus albus developed in April 1945. There was a purulent infiltration of the bleb, hypopyon and yellow reflex behind the lens. Treatment consisted of atropine, instillation of penicillin drops (2,500 units per c.c.) every hour, the oral administration of sulfadiazine, penicillin intramuscularly in 20,000-unit doses every four hours, and typhoid vaccine intravenously. Under this regimen the eye became worse. Two-tenths cubic centimeter of penicillin solution (2,500 units per c.c.) was injected into the vitreous. About 24 hours later glaucoma developed and atropine was discontinued. Practically complete recovery resulted, with normal pressure and vision of 20/20. Repeated infections of the bleb did not result in formation of scar tissue but lead to thinning of its conjunctival covering, which ruptured spontaneously.

John C. Long.

14

EYELIDS AND LACRIMAL APPARATUS

Arisi, Ebe. **Morphologic study of the bony lacrimal fossa and lacrimal duct.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 298-304.

The axes of the fossa of the lacrimal sac and the lacrymonasal duct vary considerably in direction. The more acute this angle the greater is the predisposition to the retention of tears. Dacryocystitis develops in the great majority of cases from stenosis at the level of the junction of the sac and the duct. The white race is more subject to stenosis than the negro. Arisi concludes that the angle formed by the two axes is almost always more acute on the right side, is more obtuse in brachycephalic heads, and more acute in dolicocephalic heads. (5 figures.)

Eugene M. Blake.

Brognoli, Carlo. **Considerations in the surgical treatment of ptosis.** Arch. di Ottal., 1946, v. 50, July-Aug., pp. 169-192.

The surgical treatment of ptosis was divided by Terrien into four groups: 1. a shortening of the lid by excision of a strip of skin from the lid, 2. the use of the frontalis muscle as an elevator of the lid, 3. advancement, or advancement plus shortening of the levator palpebrae, 4. the use of the superior rectus as an elevator. Brognoli describes representative procedures in each group and evaluates each. Variations of the methods in the third and fourth group were used almost exclusively in

the series reported. Brognoli feels that utilizing a part of the superior rectus as the elevator of the lid has one defect in that the binocular vertical balance is disturbed. This is true when a transplantation is done by the methods of Motais and Bardelli, or a symblepharon is created between the lid and the eyeball by the method of Nida. Shortening and advancement of the levator muscle, whether paretic or paralyzed, seemed to yield the most satisfactory results, using the method of Blaskovic. The method is described in detail. The use of different colored sutures for different tissues is advocated to eliminate confusion. (18 photographs.) Francis P. Guida.

Czukrász, Ida. **Contributions to total blepharoplasty.** Brit. Jour. Ophth., 1947, v. 31, Feb., pp. 108-113.

Three cases are presented, which illustrate different methods of substituting the total lack of eyelids. Hughes's method is equally adaptable to restore the upper or lower lid. Blaskovic's second operation is suitable when the whole upper lid is missing. The Hungarian plastic generally is used only for substituting the lower lid, but when both lids are lacking the sliding flap is recommended. With loss of both upper and lower lids replacement at once with one arched plasty is indicated, if one is to hope to save the globe. (11 figures.) O. H. Ellis.

Filatov, V. P. **Plastic reconstruction of the lids with a round pedicle.** Vestnik Oft., 1945, v. 24, pt. 3, pp. 9-10.

Filatov advocates using flaps with round pedicles from the forehead, or the lid of the other eye for plastic reconstruction of the lids. To illustrate their use, he reports three cases, in one of which the left eyeball was left without the protection of the upper lid. The right eyeball was atrophic and the orbit deformed. By means of a round pedicle Filatov used the tissue of the right upper lid for the reconstruction of the left upper lid. Ray K. Daily.

Frieberg, Torsten. **Physiologic considerations in the treatment of the lacrimal passages.** Acta Ophth., 1941, v. 19, pt. 2, pp. 93-108.

The conventional methods of examination and differential diagnosis for the site of the obstruction in the lacrimal passages are reviewed. The author defends Bowman's operation for stenosis of the lacrimal punctum. He regrets that the West-Polyak intranasal operation has not obtained its deserved popularity probably because ophthalmologists find it difficult to acquire a good intranasal surgical technic. Patients with epiphora consult the ophthalmologist first, and are subjected to some other surgical procedure. (Illustration.) Ray K. Daily.

Gandolfi, C. **Primary epithelioma of the lacrymal sac.** Rassegna Ital. d'Ottal. 1941, v. 10, Nov.-Dec., pp. 576-585.

The bibliography of tumors of the lacrimal sac is reviewed and an instance of primary epithelioma is reported. The tumor was of the papillary type. There follows a discussion of the clinical differential diagnosis of neoplasms of the lacrymal sac. (2 figures.) Eugene M. Blake.

Garbino, Carlos. **Allergic reactions to tears from tuberculous patients.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Nov., p. 617.

By means of intradermal tests the author studied the reaction to tears. In the first group he injected tears from allergic children into allergic and non-

allergic ones. A positive reaction was obtained in all allergic children. In the second group the injection of tears from nonallergic children into allergic ones caused no reaction. Children with phlyctenular keratoconjunctivitis as well as healthy ones were used in these experiments. The author concludes that these tests are specific reactions similar to those of tuberculin. (Tables, bibliography.) Plinio Montalván.

Haas, M. E. **Ablation of the orbital lacrimal gland.** Ann. d'Ocul., 1946, v. 179, Sept., pp. 497-502.

Following an anatomical review, the surgical indications are mentioned. These include prolonged and resistant epiphora due to numerous causes. Chloride of calcium is given several days before the operation to prevent bleeding and hemocoagulin is injected one-half hour before operation. Regional anesthesia with 2 c.c. of 4-percent procaine solution is used. A skin incision is made at the upper temporal orbital margin. The incision is then deepened to include the periosteum which is raised with an elevator. The gland which is fixed by a suture, is dissected with scissors. Deep and superficial sutures of 3-0 catgut are used to close the wound. Chas. A. Bahn.

Ivanova, E. M. **Rhinostomy, and its indications.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 12-14.

Averbach was a strong champion of dacryocystorhinostomy, and under his direction 6000 operations had been performed at the Institute. On the basis of this clinical experience Ivanova concludes that the operation is indicated in all cases of purulent dacryocystitis, and that it has no contraindications.

Ray K. Daily.

Kanbai, G. G. **Restoration of the lacrimal canaliculus in plastic surgery of the lower lid.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 83-85.

Three cases are reported in which fire-arm injuries of the face involved the lower lid and the lacrimal canaliculus. Plastic restoration of the lower lid was combined with suture of the torn ends of the canaliculus over a probe, which remained in place several days. The results were satisfactory.

Ray K. Daily.

Khaiutin, S. M. **Surgical restoration of the lids.** Vestnik Oft., 1945, v. 24, pt. 4, pp. 26-28.

Khaiutin utilized the cicatricial tissue of the lid for the inner layer of the new lid, by separating it from the tissues and turning it towards the palpebral fissure. The outer layer of the lid is formed by a pedicle graft from the temple. The author found this technic satisfactory, the results permanent, and the post-operative period comparatively short. (3 illustrations.)

Ray K. Daily.

Lagos, E. J. J. **Dacryocystorhinostomy. Technique of Dupuy-Dutemps-Bourguet-Valle.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Nov., p. 639.

The author discusses the advantages of dacryocystorhinostomy over dacryocystectomy in the treatment of dacryocystitis. He prefers the Dupuy-Dutemps-Bourguet-Valle technique and describes the preoperative management of the patient, with special attention to the condition of the lacrimal passages and the nose. The indications and contraindications for dacryocystorhinostomy are discussed. His experience in over 100 operations is briefly reviewed.

Plinio Montalván.

Lloyd, I. **A survey of the results of lacrimal stricturotomy.** Brit. Jour. Ophth., 1947, v. 31, Jan., pp. 51-54.

The author performed 33 stricturotomies on 31 patients according to the method used in the French clinics. The lower canaliculus is opened with a Weber knife for 3 mm. and dilated with a number 3 sound. The stricturotomy knife is passed down into the sac and engaged in the neck of the duct. It is then verticalized and rotated through an angle of 45 degrees. Gum-elastic sounds from number 11 to 14 are passed and the largest left in situ for 10 minutes. Dilatation is continued at intervals of two weeks for two months.

The French claim 100 percent of patients are cured when there is no bony obstruction and 70 percent when there is. In the hands of the author 52 percent were cured and 24 percent much improved. He feels that the technique possesses many advantages over ordinary probing and that its benefits are considerably more substantial.

Morris Kaplan.

Malbrán, J., and Arrechea, A. **Filamentous keratitis and keratoconjunctivitis sicca.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Nov., p. 603.

The authors report four cases of keratoconjunctivitis sicca. They tabulate the symptomatology, review the literature in detail and conclude that filamentous keratitis is due to lacrimal hyposecretion or keratoconjunctivitis sicca, which may result from different causes. The diagnostic value of the Schirmer test is emphasized. (Bibliography.) Plinio Montalván.

Morano, Massimo. **Connections between dacryocystitis and paranasal sinus affections.** Riv. Oto-Neuro-Oft., 1943, v. 20, Jan.-Feb., pp. 40-63.

Between January, 1939, and May, 1942, the Bologna ophthalmologic department treated 380 patients with inflammation of the lacrimal sac. Fifty-four had peridacryocystitis complicated by inflammation of the anterior ethmoidal cells, seven complicated by polysinusitis, and only five were without sinus disease. Among those who had only an infection of the lacrimal sac itself, were 66 with anterior ethmoid involvement, one with polysinusitis, and 247 without any paranasal sinus disease. The latter occurs in 92, of 4 percent of all peridacryocystitic processes, and in only 21, or 3 percent of dacryocystitis without involvement of the surrounding tissues. The importance of exact nasal and X-ray examination is stressed. (13 excellent X-ray pictures, 24 references.)

K. W. Ascher.

Noe, C. A. **Penicillin treatment of eyelid infections.** Amer. Jour. Ophth., 1947, v. 30, April, pp. 477-479. (8 references.)

Shartz, S. E. **The correction of eversion of the lower lacrimal punctum.** Vestnik Oft., 1945, v. 25, pt. 3, pp. 36-37.

The author excises a triangle of conjunctiva and subconjunctival tissue below the punctum. The triangular wound is sutured, and the ends of the suture passed through the entire thickness of the lid and tied above the lower orbital margin. An over or undercorrection can be adjusted by tightening or relaxing the suture. (Illustration.)

Ray K. Daily.

Suarez Villafranca, M. R. **Malformation of the lacrimal passages; an embryologic study.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Oct., pp. 1027-1037.

The embryology of the lacrimal passages is reviewed, and a case of congenital malformation reported. The 18-months-old child had a congenital coloboma of the left lower lid. There was a mass the size of a pea on the tarsal conjunctiva at birth which gradually increased to the size of a walnut. At the age of three months an attempt at surgical repair of the coloboma failed. There was a fistulous tract in the nasolabial angle, from which a mucopurulent secretion exuded. Pressure on the mass expelled a clear and then a mucopurulent fluid through the misplaced inferior canaliculus. Three surgical procedures were performed: excision of the mass, excision of the fistulous tract, and a plastic operation for repair of the coloboma. Histologically the fistula was found to be lined with cylindric epithelium over a layer of flat cells and the stroma was infiltrated with lymphocytes. The anomaly was probably produced by a failure of the nasal and maxillary bones to coalesce; the disturbance in this region lead to coloboma of the lid, facial asymmetry and incomplete development of the left side of the nose. In the sixth week of embryonic life an epithelial bud forms from which the lacrimal passages develop. If in its development the ectoderm fails to disappear, its invagination into the mesenchyme is disturbed, and it is not included in the osseous lacrimonasal canal. A second possibility is an interference with the closure of the orbitonasal sulcus and a failure to include the lacrimonasal passages. Ray K. Daily.

Tikhomirov, P. E. **The relation between epiphora and nasal pathology.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 28-34.

The literature is reviewed and the relevant clinical data in 100 persons with epiphora, and 50 persons from the rhinologic clinic with various nasal diseases are reported in detail. The correlation of the data leads to the conclusion that stenosis of the lacrimonasal canal which leads to dacryocystitis is usually associated with a diseased mucous membrance of the nose. Epiphora due to changes in the upper portion of the lacrimal apparatus has no relation to nasal abnormalities. In reflex epiphora due to hypersecretion of the lacrimal gland nasal lesions are not infrequent, but their etiologic role is difficult to evaluate, because treatment of the nose does not always lead to cessation of the epiphora.

Ray K. Daily.

Villanueva, M., and Damel, C. S. **Mikulicz disease.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Nov., p. 599.

The authors report a case of Mikulicz disease in a 33-year-old man. There was no marked improvement after deep X-ray therapy. (Photographs.) Plinio Montalván.

15

TUMORS

Goedbloed, J., and Wÿers, H. J. G. **Lymphoblastoma folliculare.** Acta Ophth., 1941, v. 19, pt. 1, pp. 28-43.

The 60-year-old patient, who had enlarged inguinal glands for 13 years, developed small symmetrical orbital tumors. Excision was followed by extensive recurrence with retobulbar extension and exophthalmos. The exophthalmos disappeared after X-ray therapy. Microscopically, the excised tumor presented a typical picture of lpmphoblastoma. (7 photomicrographs.)

Ray K. Daily.

16
INJURIES

Brodsky, B. S. **The scleral incision in extraction of foreign bodies from the eye.** Vestnik Oft., 1946, v. 25, pt. 3, pp. 12-14.

Brodsky opens the eyeball by means of a trephine opening through the sclera. In 10 of 12 patients no incision in the choroid and retina was necessary.

Ray K. Daily.

Carrearas Duran, B. **An unknown intraocular foreign body.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Sept., pp. 926-933.

A man, 24 years of age, had an intraocular foreign body for many years of which he was not aware. For the last two years he had gradually lost vision in his right eye, but before this time his eyes had never given him any trouble. Upon examination an enlargement of the volume of the right eye, a fine corneal scar and optic disk atrophy with deep glaucomatous cupping were found. Tension was 50 mm. of Hg. The left eye was normal. A diagnosis of absolute secondary glaucoma due to intraocular foreign body was made. The eye was enucleated and a small piece of steel was found embedded in the internal retinal layer.

J. Wesley McKinney.

Chechik-Kunina, E. A. **Lysozyme in the treatment of burns and perforating ocular injuries.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 42-44.

From the study of 54 patients, the author concludes that in perforating ocular injuries the lysozyme titre is diminished, and that the number of infections is in direct relation to the diminution of lysozyme in the tears. The titre of lysozyme can therefore be used as a prognostic indication. Clinical instillation of lysozyme into the conjunctival sac every two hours acts favorably in perforating ocular injuries, and in burns in which conservative therapy is effective. Laboratory experiments on rabbits confirmed the effectiveness of lysozyme in burns.

Ray K. Daily.

Ershkovish, I. G. **Tissue therapy with Filatov's method in traumatic iridocyclitis.** Vestnik Oft., 1946, v. 25, pt. 1, pp. 13-20.

Fifty-eight patients with severe traumatic iridocyclitis after perforating injuries were studied; 36 patients had only one eye, and 28 eyes contained foreign bodies. In 35 there were additional injuries in other parts of the face. In 29 patients tissue therapy was the only therapeutic procedure; in the others tissue therapy was given preliminary to surgical procedures, which could not be performed because of severe inflammatory symptoms or were not indicated because of imperfect light projection. Tissue therapy arrested the inflammatory process, and frequently made surgery possible on an apparently hopeless eye. The tabulated data show that only three of the 58 patients remained without improvement. (1 table.)

Ray K. Daily.

Ershkovich, I. G. **The treatment of so-called hopeless ocular war injuries.** Vestnik Oft., 1945, v. 24, pt. 4, pp. 19-22.

Because of the results achieved with tissue implantation therapy Ershkovich believes that our prognostic standards need revision. Cases are reported to illustrate that eyes with lesions in the anterior segment and faulty light projection can be given some vision by

means of tissue therapy and surgery. The hopeless prognosis of severe injuries of the optic nerve and retina should also be modified; eyes with dense vitreous opacities, with traumatic chorioretinitic foci involving the macula have been benefited by therapy. Illustrative cases are reported.

Ray K. Daily.

Filatov, V. P. **Optic operations on subatrophic eyes.** Vestnik Oft., 1945, v. 24, pt. 3, pp. 8-9.

Filatov urges that an effort be made to restore to every soldier some degree of vision. For this purpose he advocates prolonged tissue therapy preliminary to surgery. After tissue therapy faulty light projection may become normal. After that, discission of organized exudates may lead to restoration of some degree of vision. Two case histories are reported as illustrations. One patient recovered vision of 3/100, and the other 2/100. Even such low visual acuity is appreciated by patients, and no effort should be spared to attain it. Even eyes in the process of atrophy, with faulty light projection should be treated in the hope of recovering light projection, and be given the benefit of optic operations. In seven out of 25 eyes some vision was thus restored.

Ray K. Daily.

Kantorovich, A. I. **The indication for extraction of intraocular foreign bodies in old war injuries.** Vestnik Oft., 1945, v. 25, pt. 3, pp. 14-17.

A clinical experience with 35 cases shows that late removal of intraocular foreign bodies is much more complicated than early operation. It is even more difficult to establish the magnetic character of foreign bodies after a time. The author believes that a foreign body of long standing in an only eye which has some vision and is free from inflammatory symptoms is best left alone. An attempt at extraction should be made only when there is an intractable iridocyclitis. If the magnetic test is positive in a patient who has one sound eye the foreign body should be extracted, even if the eye is quiet. With a negative magnetic test accurate localization with X ray is indispensable. A foreign body imbedded in the ocular wall should be extracted through a window opening in the sclera.

Ray K. Daily.

Kolarsz, E. K. **Electromagnetic surgery in base hospitals.** Vestnik Oft., 1946, v. 25, pt. 3, pp. 9-12.

The large number of ocular injuries in the last war is due to the predominance of artillery fire. Ninety percent of the ocular injuries were caused by fragments, 9.8 percent by bullets, and 69.6 percent of the ocular injuries had intraocular foreign bodies. Only 1.2 percent of these patients reached the base hospitals within ten days after the injury; most of them arrived there one month after the injury and later. Of 245 foreign bodies, 139 were successfully extracted. In 11.8 percent of the patients the eyeball was subsequently enucleated because of a severe postoperative iridocyclitis. In 2.4 percent retinal detachment appeared three to four weeks after the extraction. The author urges extraction within two to three days after the injury, electrocoagulation of the edges of the scleral incision, and the application of the electromagnetic test when foreign bodies are suspected. (3 tables.)

Ray K. Daily.

Levkoeva, E. F. **Ocular injuries.** Vestnik Oft., 1945, v. 24, pt. 3, pp. 11-19.

On the basis of the histologic examination of 6,000 eyeballs enucleated after

various trauma, Levkoeva sought to evaluate their clinical management. One is impressed with the fact that ocular wounds can not be managed on general surgical principles. The eyeball represents a closed complicated system, with unstable interrelationships of its inner portion; insignificant disturbances, small exudates or hemorrhages may lead to loss of the eye. This is particularly the case in peripheral injuries to the cornea and sclera which maintain the shape of the eyeball. In more or less extensive injuries of this capsule with gaping of the wound, the mechanical abnormality may lead to a disturbance of the intraocular metabolism with all its dire consequences. The first and immediate concern of the surgeon should be accurate closing of such wounds and restoration of normal anatomic relationships, leaving the danger of infection or sympathetic ophthalmia for later consideration. The histologic sections indicate definitely that not closing the wound with sutures is equal to trusting to luck. A Kuhnt conjunctival flap is inadequate to close the wound, and its main objective is the prevention of infection, and not adequate wound closure. Levkoeva vigorously condemns the use of the Kundt flap because it gives false security and she urges the development of a standardized technic for firm and accurate closure of corneal and scleral wounds. (5 photomicrographs.)

Ray K. Daily.

Loginov, G. G. **Comarative evaluation of Kundt's conjunctival flap and sutures in the management of ocular wounds.** Vestnik Oft., 1945, v. 24, pt. 3, 21-27.

Thirty-seven injured eyes were studied; 19 had corneal wounds, nine scleral, and nine had post-operative wounds of the anterior portion. When streptocide powder is used the results are better with sutures, than with the conjunctival flap. The defects of the Kuhnt flap are the imperfect coaptation of the edges of the wound, and the prolific growth of connective tissue within the wound. The merit of the Kuhnt flap is the ability to prevent prolapse of uveal tissue and to prevent infection, but these objectives are achieved just as well with sutures. The sutured wound has well coapted edges, withstands raised intraocular tension, and prevents secondary invasion of the wound by microorganisms. There is less connective tissue formed within the sutured wound and within the eyeball. Sutures of the sclera also limit penetration of connective tissue growth. Suturing of the wound shortens the post-operative period. In most severe injuries the sutured eyeball retains its shape. The variety of wounds and their location does not permit the use of visual acuity as a criterion for the effectiveness of the wound closure.

Ray K. Daily.

Mann, Ida, Pirie, A., and Pullinger, B. D. **The treatment of Lewisite and other arsenical vesicant lesions of the eyes of rabbits with British anti-Lewisite (BAL).** Amer. Jour. Ophth., 1947, v. 30, April, pp. 421-435. (12 figures, 7 tables, 9 references.)

Moncreiff, W. F. **Some common errors of the general physician in dealing with foreign body injuries of the eye.** Clin. Med., 1946, v. 53, Sept., pp. 257-258.

The commonest mistake is the failure to find foreign bodies embedded in the cornea or hidden in the retrotarsal fold. The use of fluorescein aids in locating the foreign body. Removal with

a cotton applicator should be tried first; if not successful, a sharp, U-shaped spud is recommended.

Irwin E. Gaynon.

Ravasini, C. **A case of rupture of the sclera with luxation of the lens beneath Tenon's capsule.** Rassegna Ital. d'Ottal., 1941, v. 10, Sept.-Oct., pp. 451-486.

The author describes a case of equatorial rupture of the sclera with luxation of the lens in the posterior segment of the globe, beneath Tenon's capsule. He gives a detailed macroscopic and microscopic description and discusses the pathogenesis and the characteristics of scleral rupture. The scarce literature on this subject is reviewed and abstracted, and demonstrates that for the lens to be dislocated posteriorly the tear in the sclera must be equatorial. E. M. Blake.

Rodigina, A. M. **Surgery of perforating ocular injuries.** Vestnik Oft., 1945, v. 24, pts. 1-2, pp. 53-55.

On the basis of clinical experience and experimental work on rabbits, Rodigina advocates suture of corneal and scleral wounds. When there is no injury to the lens, such wounds heal without infection even if sutured several days after the injury. Eyes with injury to the lens healed better when sutured, but dense cicatricial tissue that develops around the lens often leads subsequently to shrinking of the eyeball.

Ray K. Daily.

Senâ, José A. **Errors in the roentgenologic diagnosis of intraocular foreign bodies.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Nov., p. 622.

After discussing the value of the roentgenologic investigation of intraocular foreign bodies, the author reports three cases to prove that this procedure is not always absolutely accurate. In one patient a defect in the X-ray apparatus led to a diagnosis of intraocular foreign body, the existence of which could be disproved by the history and clinical examination. In another the foreign body was clinically located and removed in spite of negative plates. In the third the X-ray film definitely led to a diagnosis of foreign body outside the globe, but the clinical examination and surgical removal proved it to be intraocular. The author emphasizes the importance of a careful clinical examination, to which all other diagnostic procedures must be subordinated. Plinio Montalván.

Shershevskaya, O. **Treatment of war invalids for sequelae of injuries of the eyeball and its adnexa.** Vestnik Oft., 1945, v. 24, pt. 4, pp. 15-19.

This material consists of invalids, from one to three years after the injury. The striking feature was the fact that the pathologic process in the eye was not yet completed; in some apparently hopeless eyes massive exudates in the vitreous became absorbed, whereas some eyes which were quiet for a long time suffered severe damage from exacerbations of an old iridocyclitis. Such exacerbations may occur in eyes several years after a perforation in any portion of the eyeball, even without an intraocular foreign body. These processes testify to the great virility and pathogenicity of latent infectious processes within the eye. The lesions were varied, and usually severe and complicated; most eyes had had some surgical repair in the base hospitals. Persistent efforts were made to restore some degree of vision. As an example the case of a 21-year-old man is reported. His only eye had an almost complete leucoma, with a small area of

clear cornea close to the limbus, through which one could see the atrophic iris adherent to the cornea. The first operation was a keratoplasty with resection of the adherent iris; the cataractous lens, which then became visible was removed at a second operation six weeks later. Corrected vision was 0.06. Later glaucoma developed, which was controlled by paracentesis. The clinical experience with this group of patients demonstrates that old exudates in the vitreous may be absorbed under intensive therapy, and considerable vision obtained. An original procedure described is an excision of the sphincter of the iris with the cicatricial membranes attached to it. After a corneal incision a small knife punctures the sphincter, and with a sawing motion the entire sphincter is cut away from the iris; the sphincter with the lens capsule and organized exudate is removed with forceps. Preliminary X-ray irradiation is probably important in the smooth postoperative recovery.

Pedicle grafts were used for plastic repair of the lids. Ray K. Daily.

Stellard, H. B. **The intraocular foreign body.** Brit. Jour. Ophth., 1947, v. 31, Jan., pp. 12-40.

This long, detailed article is the report of 72 cases of penetrating wounds of the eye with retained foreign body and is a sequel to a report of 102 such cases previously reported. They occurred in the campaigns in the Western Desert and in Normandy. The majority of foreign bodies produced by fragmentation of modern air missiles are so slightly magnetic that the technique of localization and extraction differs from that in civil practice. The "magnet test," pain caused by waving the magnet over the eye, was negative in many cases, and yet if the giant magnet tip was placed very close to the foreign body its extraction was effected.

Investigation must be complete. Many wounds of entry are well healed at the time of examination, and all the surrounding adnexa must be carefully studied. In one case a shell splinter entered the occiput, traversed the intracranial contents, entered the orbit from behind, penetrated the sclera and came to rest in the vitreous while the patient remained completely unaware of it.

Aluminium and some nonmetals give rise to no signs of irritation within the eye and if not large enough to obstruct vision are best left alone. Small pieces of glass and bakelite were left alone but copper and stone caused violent inflammation. Localization was accomplished by ophthalmoscopy in 45 patients. X-ray was used on all the others. The Sweet and Dixon methods are the most ideal but were entirely unsuited for mobile warfare. A limbal ring sutured to the conjunctiva was used and served well enough.

For extraction, the posterior scleral route was much preferred with the use of the Solus giant electromagnet. The instrument was always mounted on a stand. The area around the incision was always subjected to diathermy and no retinal separation or even vitreous loss was experienced. Stallard insists that retinal detachment does not follow careful surgery. There were no infections.

Visual results were very satisfactory.

Morris Kaplan.

17

SYSTEMIC DISEASES AND PARASITES

Feigenbaum, A., and Kornblueth, W. **Posterior ring abscess of metastatic origin in Behcet's disease.** Brit. Jour.

Ophth., 1946, v. 30, Dec., pp. 729-734. (See section 6, Cornea and sclera.)

Gilbert, T. M., and Hing, S. R. **The Stevens-Johnson syndrome.** M. J. Australia, 1946, v. 2, Nov. 30, pp. 774-776.

The occurrence of Stevens-Johnson syndrome in a 40-year-old soldier is described. The patient had typical lesions of the oral mucous membranes, followed by a sloughing pseudomembrane. There was bilateral purulent conjunctivitis, in the course of which conjunctival bullas eventually developed. The patient had a moderate hyperpyrexia, and an exanthematous dermatitis that resembled erythema multiforme.

On the fifth day, pneumonia developed. The patient was treated with penicillin systemically and locally in the eyes. Within two weeks the conjunctivitis and stomatitis had cleared up, and the patient was discharged as completely cured after five weeks. The conjunctival blebs and the pulmonary complications were considered to be unusual features. Benjamin Milder.

Gordon, D. M. **Hemifacial spasm.** Arch. of Ophth., 1947, v. 37, March, pp. 282-293.

Hemifacial spasm is a condition in which the patient has paroxysms of twitchings in muscles innervated by the seventh nerve. The condition is not under voluntary control and defies mimicry. Hemifacial spasm is not a tic. The spasm occurs during sleep and is not broken by will. It is usually clonic but may become tonic.

The condition of hemifacial spasm is described and attention called to the fact that at least two forms exist, one idiopathic and the other following regeneration of a traumatized seventh nerve. An illustrative case of each is presented. Treatment, differential diagnosis, and literature, are discussed.

R. W. Danielson.

Jebejin, R., and Kalfayan, B. **Oculo-buccogenital syndrome.** Ann. d'Ocul., 1946, v. 179, Sept., pp. 481-491.

In a preceding article the authors described this syndrome which consists of acute iritis with hypopyon, ulcers of the mouth and genitals, and nodular erythema. Frequent also is recurrent swelling of the salivary glands with fever and recurrent retinal hemorrhage with proliferative changes, especially in the young. An acid resisting bacillus was found in the sections but its cultural characteristics have not been determined. The authors believe that the initial stage is characterized by phlebitis with recurrences, which may be complicated by more or less obliterative thrombosis, but which usually heal. The symptoms are probably a part of a general infection transmitted through the blood in which phlebitis is an important factor, but in which allergy also plays a part. Behcet, whose name is associated with part of this syndrome suggested that a virus infection is the probable cause. The authors concluded that this syndrome is not an atypical form of tuberculosis. (6 references.) Chas. A. Bahn.

Koff, R., and Rome, S. **Diabetic retinopathy.** Western Med. and Surg., 1947, v. 1, March, pp. 31-34.

A large percentage of diabetic patients develop retinal damage and many of them will suffer enough loss of vision to become occupationally disabled. One or two percent will become totally blind. Visual deterioration may take months or years to develop, but

may be retarded or arrested by the coordinated care of the ophthalmologist and internist. (5 fundus photographs.)

O. H. Ellis.

Krutova, A. H. **Primary and secondary eye lesions in tularemia.** Vestnik Oft., 1946, v. 25, pt. 4, 23-26.

A drop of a culture of the organism instilled into the conjunctival sac of one eye of a rabbit produced characteristic granulomatous lesions in every case. The control eye remained normal, except in one animal which had extensive hemorrhages into the lacrimal gland. Nearly all animals died from a generalized infection before the pathologic process in the eye was concluded. The microscopic studies revealed granulomatous foci in the cornea and ciliary muscles. Secondary ocular lesions appear on the eighth or ninth day of the infection, are bilateral, and are not associated with a local lymphadenitis; the clinical symptoms indicate that they are the result of a hematogenous metastatic process, the original focus of which may be in an internal organ. This study emphasizes the importance of a thorough general examination of patients who have apparently recovered from Parinaud's disease.

Ray K. Daily.

Laforet, E. G., and Lynch, C. L. **Multiple congenital defects following maternal varicella.** New England J. Med., 1947, v. 236, April 10, pp. 534-537.

A well authenticated episode of maternal varicella complicated the eighth week of pregnancy. An infant was born with extensive developmental defects. The theoretic implications are discussed.

F. H. Haessler.

Lijó Paviá, J. **Sella turcica. Bone lesions. Retinal changes. Favorable treatment with gonadotropine.** Rev. Oto- Neuro-Oft., 1946, v. 21, July-Aug., pp. 73-81.

This paper presents eight further cases of sellar lesions, which, like three similiar ones that have been reported were successfully treated with hormones. In this new series the patients were 16 to 47 years of age, five of them were female. They complained of diminishing visual acuity. The ophthalmoscopic findings included choroidal vascular sclerosis, retinal vascular sclerosis, foveal pigment changes, retinal hemorrhage, macular changes, chorioretinal atrophy, and pale discs. All showed radiographic evidence of sellar changes, such as osteolysis, and rarefaction or decalcification of the clinoid processes. Three of the patients had syphilis, and six showed evidence of endocrinal disturbance. All had mild to severe concentric contraction of the field. After treatment with lobulantine, the majority showed definite improvement in visual acuity. (Bibliography, 8 schematic radiographs.)

Edward Saskin.

Puglisi-Durante, G. **The behavior of the cerebrospinal fluid in ocular and nervous affections from acquired lues.** Riv. Oto-Neuro-Oft., 1946, v. 21, May-Aug., pp. 153-167.

Tests were made on the cerebrospinal fluid of patients with different eye diseases of luetic origin (tabetic optic atrophy, postneuritic optic atrophy, optic neuritis, choked disc, oculomotor paralysis). The findings were compared with those obtained in cases of cerebrospinal lues with no eye complications. The result of the investigation in tabulated form demonstrates that the changes of the cerebrospinal fluid only show that a luetic condition

exists in the neuro-axis and its meninges. (Bibliography.)
Melchiore Lombardo.

Sironi, Luciano. **Ocular symptoms in a case of neuraxitis.** Riv. Oto-Neuro-Oft., 1942, v. 19, Sept.-Oct., pp. 327-337.

A 20-year-old man presented paresthesias and pareses of his limbs and signs of paralysis of his seventh, ninth, and twelfth cranial nerves; there was a paresis of his right sixth nerve, and nystagmus in extreme lateral gaze. Meticulous study lead to the diagnosis of a disseminated encephalomyelitis (neuraxitis). K. W. Ascher.

18

HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Fallippi-Gabardi, E. **Falloppio's description of lacrimal fistula.** Rassegna Ital. d'Ottal., 1946, v. 15, July-Aug., pp. 315-318.

Gabriele Falloppio, the great anatomist and surgeon of the renaissance, was the first to give a clear description of the lacrimal passage and its affections. The article is an historical review of the early knowledge of the lacrimal apparatus. Eugene M. Blake.

James, R. R. **Mr. Surphlete, an item of ophthalmological history.** Brit. Jour. Ophth., 1947, v. 31, Jan., pp. 3-8.

The will of one Richard Surphlete, who lived in the early seventeenth century is reprinted and commented upon. There is some question as to who Surphlete, a quack oculist, was. The testator may have been the translator of Laurrentius. The will is of interest in many ways, and particularly as showing what a medical man took to sea with him. Morris Kaplan.

Traquair, H. M. **Removal of the wrong eye.** Brit. Jour. Ophth., 1947, v. 31, Jan., pp. 8-12.

Traquair discusses the truth of the oft repeated statement that the wrong eye had been surgically removed. All the evidence is marshalled, but he has been able to find none that is conclusive. Morris Kaplan.

Vasserman, I. A. **Glaucoma in Turkmen.** Vestnik Oft., 1946, v. 25, pt. 5, pp. 47-50.

A brief summary of the tabulated data of the various institutions that treat ocular diseases shows that glaucoma heads the list of causes of blindness, and that its incidence in Turkmen does not differ from that of middle Europe. Ray K. Daily.

19

ANATOMY, EMBRYOLOGY, AND COMPARATIVE OPHTHALMOLOGY

Forbes, G. **Microphthalmos.** Brit. Jour. Ophth., 1946, v. 30, Dec., pp. 709-715.

The eyes of a six-months-old fetus were microphthalmic and one was removed for serial section. It was 8 mm. in diameter. The sclera presented a fibrous band which divided the ball into a small, anterior, inferior cyst and the larger true eye. This cyst communicated with the vitreous chamber and was lined with choroid and retinal pigment layer. The cyst cavity was filled with disorganized retina that was lying free. The conjunctiva was normal and the cornea was very cellular with no discernible Bowman's membrane. The choroid presented scant pigment, was folded in many places but seemed to line the entire sclera. Ciliary processes were undeveloped and iris muscles could not be seen. The ciliary muscle

was present. The lens was large and spherical and showed several irregular projections; its center was a degenerated cataract. The retina was detached and thrown forward, and had no demonstrable rods and cones.

Normally the fetal fissure begins to close in the 11 mm. stage. In this case some interference occurred earlier, probably between the fouth and sixth weeks since much tissue differentiation was obvious. There was no family history of irregularities and there was no illness of any kind during pregnancy. It was decided, nevertheless, that this malformation originated from a genetic defect or because the mother suffered an unnoticed subclinical infection. Morris Kaplan.

Gallego, Antonio. **Notes on the vasomotor fibers of the retina.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Dec., pp. 1245-1246.

Gallego illustrates with photomicrographs the vasomotor retinal fibers of a dog. The central retinal artery is surrounded by an extensive nerve fiber network which can be followed for large extents. In one case the terminal bulb is seen. Some capillaries are surrounded by a fine network of nerves, without terminal bulbs. (3 photomicrographs.)
Ray K. Daily.

Gurchot, C., Krebs, E. T., Jr., and Krebs, E. T. **Growth of human trophoblast in the eye of the rabbit; its relationship to the origin of cancer.** Surg. Gyn. and Obstet., 1947, v. 84, March, pp. 301-312.

Explants of tissue obtained from normal human placentas aged 2, 5, 7, and 9 months, were placed in the eyes of eight rabbits through incision made at the corneoscleral margin. A description of the sequence of events in each rabbit and the laboratory work which followed is given. The discussion includes 96 references. The results indicated that the tissue grew easily and promptly in the anterior chamber of the rabbit and in a manner analogous to malignant tumors. The placental tissue is referred to as heterologous trophoblast. Francis M. Crage.

Landau, E. **Contribution to the histology of the eye.** Ophthalmologica, 1946, v. 112, Sept., pp. 129-134.

The author presents two diagrammatic but not very clear drawings prepared from his sections (type of eye, method of staining not stated) which are intended to show that a certain portion of the fibers of the zonule is attached to the retina. He believes that the internal limiting membrane of the retina is in reality the prolongation of the zonule of Zinn. He then describes and depicts the histologic details of the innervation of the ciliary body, without adding significantly to or deviating from present concepts.
Peter C. Kronfeld.

Suarez, Villafranca, M. R. **Malformation of the lacrimal passages; an embryologic study.** Arch. de la Soc. Oft. Hisp.-Amer., 1946, v. 6, Oct., pp. 1027-1037. (See Section 14, Eyelids and lacrimal apparatus.)

NEWS ITEMS

Edited by DONALD J. LYLE, M.D.
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News items should reach the editor by the 12th of the month

DEATHS

Dr. Harlan Page Abbott, Providence, Rhode Island, died February 2, 1947, aged 86 years.

Dr. Frederick James Bentley, Seattle, Washington, died January 1, 1947, aged 71 years.

Franklin Fayette Lane, Capt. (MC), U.S.N., Philadelphia, Pennsylvania, died January 29, 1947, aged 58 years.

Dr. Giovanni Paccione, New York, New York, died January 22, 1947, aged 60 years.

Dr. Morris Rosenbaum, New York, New York, died February 1, 1947, aged 66 years.

Dr. Thomas Hall Shastid, Duluth, Minnesota, died February 15, 1947, aged 80 years.

ANNOUNCEMENTS

COURSE IN NUCLEAR PHYSICS

The University of California Medical School, in association with University Extension, University of California, announces a course in the applications of nuclear physics to the biologic and medical sciences to be given at the Medical Center in San Francisco from June 30 through July 18, 1947.

The course will consist of didactic lectures, laboratory demonstrations, and seminars for round-table discussions. It will be open to individuals in the fields of medical and biologic research. For detailed information write to: Dr. Stacy R. Mettier, Head of Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22.

HEED OPHTHALMIC FOUNDATION

The Heed Ophthalmic Foundation for training eye surgeons after they have finished their residencies, established by Mr. and Mrs. Thomas Heed of Evanston, Illinois, has a fund sufficient to support three fellowships, each amounting to $2,500 to $3,000. A board of five ophthalmologists representing medical schools throughout the nation will handle the fellowships. Additional information and application blanks may be obtained from the secretary of the board of directors, Dr. M. Hayward Post, 520 Metropolitan Building, 508 North Grand Boulevard, St. Louis 3, Missouri.

POSTGRADUATE COURSES ANNOUNCED

The University of California Medical School announces a postgraduate course in ophthalmology to be given at the University of California Medical Center, September 15 through 19, 1947. Classes will meet daily from 8:30 A.M. to 12 noon, and from 1:30 to 5 P.M. Requests for information and for registration are to be addressed to: Dr. Stacy R. Mettier, Head of Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22.

TECHNICIANS' EXAMINATIONS

American Orthoptic Council examinations will be held in September and October, 1947. Applications on official forms must be received before July 1, 1947. Address the American Orthoptic Council, 23 East 79th Street, New York 21.

SOCIETIES

BROOKLYN'S 100TH MEETING

The 100th regular meeting of the Brooklyn Ophthalmological Society was held on April 17th at the Brooklyn Eye and Ear Hospital. The scientific program included the following papers: "Eales' Disease," Dr. Anthony J. Barranco; "Cholesterin Crystals in the Anterior Chamber," Dr. Louis Freimark; "Toxoplasmosis in Infants," Dr. Carol Schwartz; "Heterochromia Iridis," Dr. Samson Weingeist; "Binocular Single Vision with a Contact Lens after a Unilateral Cataract Extraction," Dr. John H. Bailey; "Uveitis of Undetermined Origin," Dr. James H. Inciardi: "Vessel in the Vitreous," Dr. Louis Freimark; "Calcium Soap Cyst of the Conjunctiva," Dr. Edward Saskin; "A Case of Malignant Exophthalmos," Dr. Max Fratkin; and "Unusual Melanosis of the Iris," Dr. Walter Moehle.

MEETS WITH NEUROPSYCHIATRIC SOCIETY

On April 29th, the Milwaukee Oto-Ophthalmic Society held a joint meeting with the Milwaukee Neuropsychiatric Society. The scientific program consisted of a symposium on vertigo.

PERSONALS

Dr. Parker Heath of Detroit will move to Boston about July 1, 1947, to become pathologist at the Massachusetts Eye and Ear Infirmary. Dr. Heath will also be in charge of postgraduate teaching of ophthalmology at the Harvard Medical School and will have the rank of clinical professor.

Dr. Derrick Vail has moved his offices from the Pittsfield Building to 700 North Michigan Avenue, Chicago 11, Illinois.